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NEW METHODS FOR THE CLINICAL STUDY OF THE GALL-BLADDER*

An Elaboration of Cholecystography With Simultaneous Examination of the Stomach and Duodenum

BY GEORGE LEVENE, M.D.,† AND LESTER R. WHITAKER, M.D.†

A DECIDED advance in the radiographic diagnosis of gall-bladder disease was made with the advent of cholecystography.[1] This was universally manifested by a higher percentage of accurate diagnoses of "pathologic gall-bladder." Such a general diagnosis, however, hardly exhausts the potentialities of cholecystography in a preoperative study of the state of the gall-bladder.

Perhaps the factor which militates most against accuracy is the universal tendency to establish a general routine for cholecystographic examinations. Routine methods are never favorable to accurate observation, nor are they conducive to an exhaustive study of the case.

The fact that a gall-bladder is well visualized at a certain period and is empty after a meal, does not disprove the presence of disease. For example, soft cholesterol stones which are not dense enough to cast a positive shadow by direct examination of the gall-bladder region may be completely overshadowed by the radiopaque dye in the gall-bladder; and after the vesicle has emptied and refilled, the soft stones are again, of course, invisible. Therefore the routine of taking a film at 15 or 18 hours after giving the dye and another ½ to 1 hour after a meal may, by omission of some phases which often are invaluable to diagnosis, lead to error.

In the process of emptying, the normal gall-bladder contracts to a very small size and its mucosa lies in corrugations which present a large absorbing surface for the size of the viscus. When bile is secreted from the liver into the gall-bladder, it is at once subjected to a process of concentration. Since tetraiodophenolphthalein enters the gall-bladder mixed with bile, it appears that we have here an index to the condition of the mucous membrane. However, because of the relatively large absorbing surface, part of the mucosa may be diseased, and still leave enough of a concentrating mechanism to produce a fairly dense cholecystogram. It is, therefore, necessary to seek other criteria in establishing the diagnosis.

Contraction of the gall-bladder, whether it be due to direct nerve reflex, chemical stimulation or a hormone, undoubtedly takes place by virtue of the muscularis[2].

An impaired musculature will result in incomplete contraction of the gall-bladder with consequent partial retention of bile. In this case, very little dye excreted by the liver can be admitted via the cystic duct and a faintly visualized shadow is the result.

Likewise stones, by virtue of their displacement or by physically limiting contraction of the gall-bladder, may result in faint cholecystographic shadows; and yet, there may be very little structural change inherent in such a gall-bladder.

Adhesions to the gall-bladder from a duodenal ulcer or other lesion may impair the dynamics of the vesicle and cause poorly visualized shadows; but the gall-bladder, aside from its adhesions may be quite normal.

It is apparent therefore, that cholecystography as a routine examination entrusted to the x-ray technician is not a complete study of the gall-bladder.

COMBINED METHOD EXAMINATION

The accuracy of interpretation of results is greatly enhanced by the intravenous administration of the dye. It is illogical to assume that a standard dosage is suitable for all cases. The body weight forms a rational basis for computing the amount required. We have found 35 milligrams per kilo of body weight to be satisfactory. The administration of a full intravenous dose may occasion nausea, vomiting, diarrhoea and vaso-motor depression; a full oral dose often causes nausea, vomiting and diarrhoea. In either case the patient is often rendered physically unfit for prolonged and careful examination. In order to obviate any possible reaction, 2/3 of the estimated dose is given intravenously, supplemented by 2/3 of the required oral dose. This technic offers the advantages of both methods with the disadvantages of neither.

We have found it convenient to administer

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the drug at eight o'clock in the evening. A light (carbohydrate) meal may be allowed six hours preceding injection of the dye. It is preferable that digestion be in abeyance when the drug is administered, since it appears that no bile is stored in the gall-bladder when the stomach is emptying[3].

The following morning roentgenograms are made. In this connection it may be well to emphasize the need of careful radiographic technic. The ordinary exposure, which may produce fine black and white contrast films, is often lacking in sufficient penetration to visualize stones partially surrounded with dye (Figs. 1 & 2). Moreover, since the density of the gall-bladder shadow frequently varies during the course of an examination, it is necessary to make such changes in the exposure as will compensate for these variations. The nature of the cholecystographic examination as we conduct it requires an exposure which is a compromise between those best suited for stomach and for gall-bladder radiography.

FIG. 1. Cholecystogram showing an apparently normal gall-bladder, which, however, contained many stones. The failure to bring out mottling was due to insufficient penetration and exposure. See Fig. 2.

Perfect immobilization is essential. In addition to compression we have found material assistance in having the patient hold the nose with the fingers, preventing involuntary expiratory movement.

The field examined should be large enough to preclude the possibility of entirely missing on the plate a gall-bladder shadow not lying in the usual position. The gall-bladder may be found below the pelvic brim, or extremely high under the ribs or to the side. Not infrequently the shadow may overlie the spine and only by oblique views can they be separated sufficiently for study (Figs. 3 & 4).

CHOLECYSTOSCOPY

When satisfactory radiograms are obtained, the patient is fluoroscoped. With the average patient a gall-bladder visualized on the film is readily visible under the fluoroscope, if the op-

FIG. 2. Gall-bladder 12 hours after administration of dye showing mottling due to many cholesterol stones. (From same case as Fig. 1.)

FIG. 3. Gall-bladder shadow blending with spine, its lateral border simulating the line of the psoas muscle, so that it might easily be overlooked.

erator allows his eyes sufficient time for accommodation to the darkness.

The normal gall-bladder can be seen to move freely with the respiratory excursion. On standing, it may drop as much as three inches. Slight pressure on palpation readily displaces it in any direction. It is thus possible to determine whether perivesicular adhesions are present. Occasionally this is a difficult matter especially where local tenderness and splinting of the rectus muscle do not permit of satisfactory palpation, particularly of those gall-bladders which lie high up under the costal arch.

Tenderness which remains localized over the shadow of the gall-bladder on shifting its position relative to the anterior abdominal wall is a valuable fluoroscopic sign.

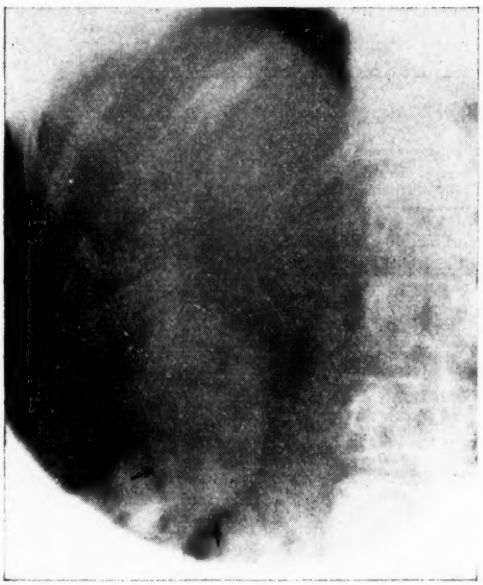

FIG. 4. Same case as Fig. 3. The shadows of the gall-bladder and spine have been separated by slightly elevating the right side of the patient during the exposure. Note rounded negative shadows, which may be due to stones. Compare with Fig. 27.

In the fasting state the gall-bladder as observed under the fluoroscope, is, aside from its passive motion during respiration, quite inactive. When food is eaten, especially fat, contraction ordinarily begins within five minutes. This phenomenon is used as a test for motor function[4, 5]. Lack of careful directions to the patient regarding the kind and amount of food to be eaten for this purpose, or the vague and diversified conceptions of the laity as to what constitutes a "fat-meal" often result in delayed emptying of the gall-bladder.

MOTOR MEAL

We have found it expedient, therefore, to standardize a meal for contracting the gall-bladder. This consists of the yolks of four eggs (the whites are discarded to diminish bulk), eight ounces of heavy cream, and ginger-ale or other vehicle in sufficient quantity to make a palatable beverage. To this are added about three ounces of barium sulphate. This meal enables us to make a combined fluoroscopic study of the stomach, duodenum and gall-bladder (Fig. 5). Simultaneous examination of these organs offers many advantages[6].

Shortly after the meal can be seen to enter the duodenum, the gall-bladder begins to exhibit active contractions, which vary in type and degree. They appear to begin by a tapering of the fundus. This is followed by progressive contractions of the circular muscle fibres, so that the vesicle appears to be subjected to a "milking process", which proceeds from the fundus towards the cystic duct. While the greatest density is usually at the fundus with the gall-bladder at rest, it now gradually moves towards the cystic duct.

Concurrent with, or immediately following, these contraction waves there is a tonic con-

FIG. 5. Simultaneous examination of stomach, duodenum and gall-bladder. Note the intimate relation of gall-bladder (arrow), duodenal cap and pyloric antrum.

traction of all the muscle fibres, which may reduce the vesicle to a finger-like shadow. The gall-bladder now presents its greatest density at its upper pole. An expulsive contraction forces a small stream of dye into the cystic duct.

If we use as a simile the functioning of the heart muscle, we may call this the systolic stage, the duration of which is about five seconds.

This is followed by a complete arrest of wave-motion and a partial relaxation of tonic contraction. During this brief interval the dye is returned to the fundus of the vesicle. The neck being empty, the gall-bladder now appears more or less circular in form and comparatively dense. Gradually the original contour is restored and the gall-bladder returns to its resting stage or diastole, which may last one to

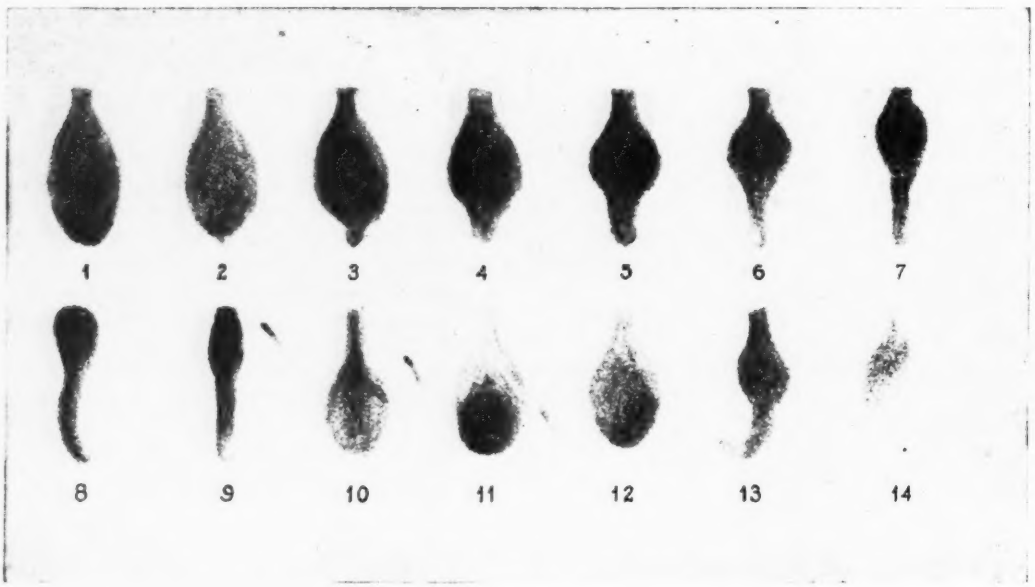

FIG. 6. The contracting gall-bladder as seen under the fluoroscope after ingestion of motor meal.
1. Resting gall-bladder; greatest density at the fundus.
2. Beginning contraction noted as a slight constriction at the fundus.
3, 4, 5, 6, 7, 8. Further stages of wave progression. The radiopaque dye-stained bile gradually moves toward the cystic duct, producing the greatest density at the upper pole.
9. Expulsive contraction (systole); dye forced into cystic duct (small shadow at right).
10. Beginning relaxation of vesicle. Note settling of radiopaque bile. The dye has moved to the end of the cystic duct.
11. Further relaxation of the vesicle and settling of radiopaque bile into the fundus. The dye has entered the common duct.
12. The gall-bladder at rest (diastole), after the completion of a contraction cycle (1-12). The vesicle is now slightly reduced in size. Compare with (1) above.
13. This figure shows the phenomenon of unequal contraction of the longitudinal bundles in the gall-bladder, pulling the fundus upward and to one side. This is normal.
14. Unequal contraction of the longitudinal bundles in a gall-bladder containing many stones. The stones did not inhibit *contraction cycles*, but their bulk limited the degree of *tonic contraction*.

FIG. 7. Resting gall-bladder 12 hours after administration of dye.

FIG. 8. Same case as Fig. 7, about one-half hour after ingestion of motor-meal. Note the definite contraction wave which has started at the fundus. Above the constriction, the vesicle appears bulged in consequence of the radiopaque bile being pushed upward.

FIG. 9. Gall-bladder 12 hours after combined intravenous and oral administration of dye in patient weighing 325 pounds. Its shadow was readily seen under the fluoroscope. The vesicle was freely movable and not tender.

two minutes. The vesicle is now slightly reduced in size. This marks the termination of one complete contraction cycle (Fig. 6, Nos. 1-12), (Figs. 7, 8).

While there is a total remission in wave motion and expulsive contraction, the recession of tonic contraction is to successively higher levels, causing a progressive decrease in the size of the gall-bladder (Figs. 9, 10, 11 & 12).

FIG. 10. Same case as Fig. 9. Pronounced emptying 30 minutes after ingestion of motor-meal. Active contractions were seen under the fluoroscope. Note appearance of negative shadow simulating stone.

FIG. 11. Same case as Figs. 9 and 10, 45 minutes after ingestion of motor-meal. The gall-bladder is now smaller than the negative shadow in Fig 10. This proves that the shadow was *not* produced by a stone.

Occasionally, during contraction there may occur irregular shortening of some longitudinal bundles, causing the fundus to be pulled upward and to one side and greatly distorting the configuration of the gall-bladder (Fig. 6, Nos. 13 & 14), (Fig. 13).

When contraction waves are faint and diffi-

FIG. 12. Same case as Figs. 9, 10 and 11, one and one-quarter hours after ingestion of motor-meal. Contraction of a gall-bladder to this size is positive evidence that stones are absent. The absence of local tenderness, the good visibility, active contractions, free mobility and complete emptying, warrant the conclusion: mucosa normal, muscularis normal, no adhesions, stones absent. See diagnostic key (Fig. 26)

FIG. 13. Cholecystogram of gall-bladder containing stones, 4½ hours after ingestion of motor-meal, showing active contractions. The fundus is pulled to one side by unequal shortening of the longitudinal bundles. Full contraction of this vesicle was prevented by the stones. (Same case as Fig. 1.)

cult to see, their presence may be inferred from alternating changes in density of the gall-bladder shadow, which, of course, are due to contraction of the vesicle. This observation must be made with the diaphragm fixed, as the same phenomenon may be produced by respiratory movements.

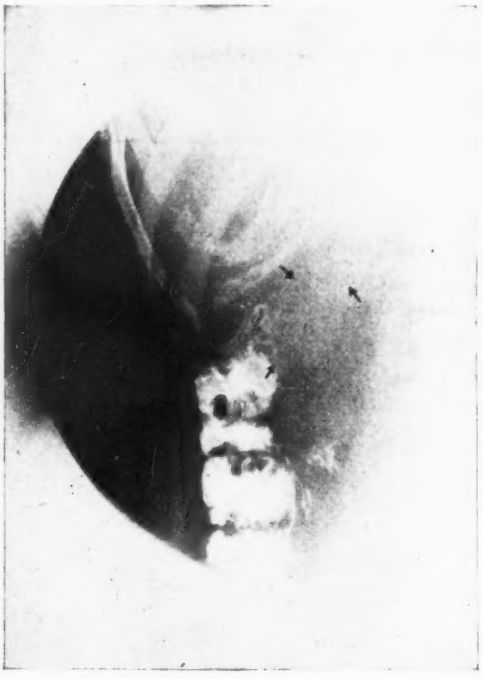

FIG. 14. Gall-bladder only partially contracted 36 hours after ingestion of motor-meal, indicating an impaired muscularis. That the vesicle had not emptied in the interval and then refilled by reabsorption of the dye was determined by radiographs every few hours. (See Figs. 18 and 19 of same case.)

Having secured ocular evidence of the activity of the musculature, we are in position to state that this structural element is, in all probability, normal. Such a muscularis may cause active contractions even if the gall-bladder is more or less filled with stones, the stones interfering only with the tonic contraction and physically limiting the ultimate size to which the gall-bladder is reduced (Fig. 13). For this reason, weak or incomplete contractions are more definitely indicative of an impaired muscularis when stones are absent.

A musculature which is appreciably thickened as a result of chronic inflammatory changes will exhibit faint contraction waves, or none at all, and its tonic contractions are weak and so protracted as greatly to retard emptying of the gall-bladder (Fig. 14). A gall-bladder which will not empty at all will not fill at all, and various degrees of concentration are intimately associated with, and parallel to corresponding degrees of emptying. Thus good visibility depends not only on the activity of the mucosa but on the muscularis as well. The clinical condition of acute gall-stone colic with jaundice caused by obstruction of the common duct is no exception, since the gall-bladder has been more or less filled with bile before its excretory channel has become occluded. During the period of occlusion, however, little, if any, bile enters the gall-bladder through the cystic duct. Whether this phenomenon is due to an already over-distended gall-bladder or to a pressure inhibition of secretion of bile by the liver, is to our minds at present conjectural.

FIG. 15. Gall-bladder 12 hours after administration of the dye. Normal, well-filled vesicle.

The tendency to regard empirically delayed

FIG. 16. Same case as Fig. 15, 30 minutes after ingestion of motor-meal. Rapid emptying.

emptying of the gall-bladder and attribute it to inherent disease is unfounded.

Since bile is intimately connected with various processes of digestion, there are many physiological reasons why contraction of the gall-bladder should parallel gastric and intestinal activity. Emptying of the gall-bladder can

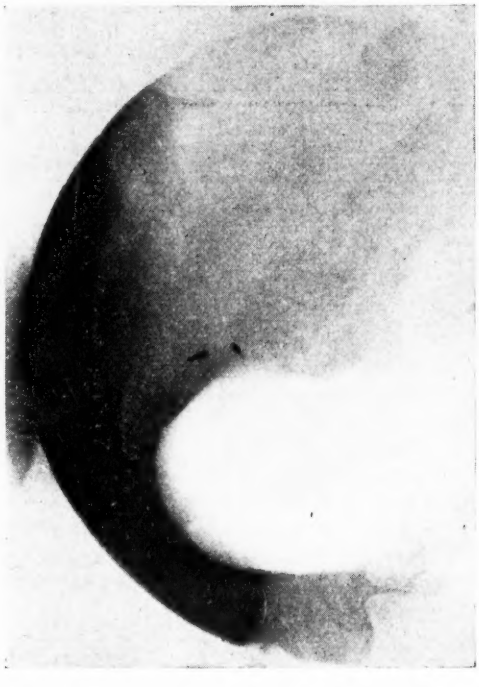

FIG. 17. Same case as Fig. 15, one hour after ingestion of motor-meal, indicating rapid emptying of a normal gall-bladder. This patient had a duodenal ulcer. However, as indicated by cholecystoscopy, the gall-bladder was free of adhesions. Confirmed at operation.

FIG. 18. Gall-bladder 12 hours after administration of dye. (Same case as Fig. 14.) Note the good visibility. Visibility, per se, is an uncertain criterion of disease. This gall-bladder showed an acute exacerbation of extensive chronic inflammatory reaction.

be delayed by manual pressure on the pylorus, which prevents emptying of the stomach. With active gastric motility there is active gall-bladder motility; with hypomotility of the stomach there is hypomotility of the gall-bladder. The delayed disappearance of the gall-bladder shadow does not, in itself, warrant a conclusion of "pathologic gall-bladder". It does, however, become

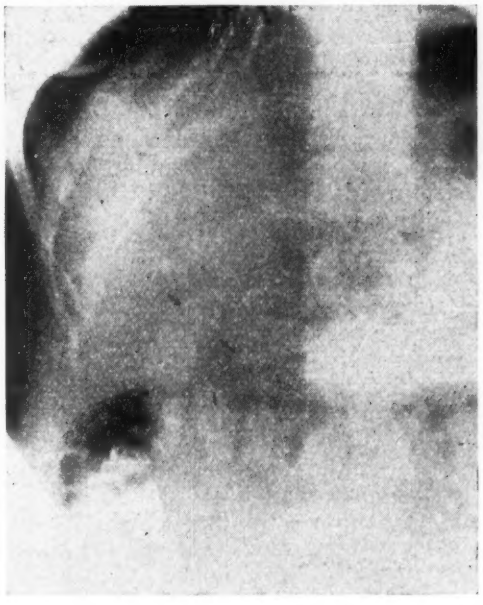

FIG. 19. Same case as Fig. 18, 7 hours after ingestion of first motor-meal, and 1 hour after second. Fluoroscopic examination revealed no contractions of this gall-bladder, marked local tenderness and apparent fixation. The stomach and duodenum showed no organic lesion. The large gastric residue was perhaps due to a reflex from a diseased gall-bladder. No further reduction in size of this gall-bladder could be induced. (See Fig. 14.)

significant when gastric motility is normal (Fig. 14). (The fat-barium mixture above described remains longer in the stomach than barium alone.)

Frequently the gall-bladder may completely empty within half an hour. This type, as far as we know, presents no histological changes which

FIG. 20. Gall-bladder 12 hours after administration of the dye, with two negative shadows simulating stones. From the radiograph alone it may not be possible to determine the significance of these shadows.

can be regarded as pathological, the hypermotility being functional or reflex (Figs. 15, 16, 17).

Concentration of bile appears to be a physical process accomplished through the medium of the mucosa. But even in the presence of moderate inflammatory changes of the mucosa a fairly good shadow of the gall-bladder may be obtained, provided it still retains its muscular contractility (Figs. 18, 19). Therefore not all gall-bladders that fill and empty are normal.

The determination of the presence of a diseased mucosa is based upon the consideration of many factors. In an acute inflammatory process the activity of the gall-bladder, like that of any other acutely inflamed organ, is very much diminished. The mucosa does not concentrate and the muscularis does not contract. Consequently, there will be no visualization of the gall-bladder, and a substantiating clinical picture will confirm the diagnosis.

In the presence of subacute or chronic cholecystitis, the gall-bladder may be visualized (Fig. 18). Concentration, however, is, as a rule, only fair or poor, and active contractions are weak, infrequent or undiscernible, their presence being inferred from alternating changes in density of the gall-bladder shadow.

As already noted, localization of tenderness directly over the gall-bladder during various changes of position of the body as determined by cholecystoscopy is of material assistance in establishing the presence of disease.*

Gall-stones containing calcium are readily demonstrated by direct examination of the gall-bladder before the dye is administered. Soft stones or precipitated cholesterol are rendered visible by the cholecystogram through contrast in density with the dye.

The term "mottling" perhaps best describes the appearance of a gall-bladder containing soft

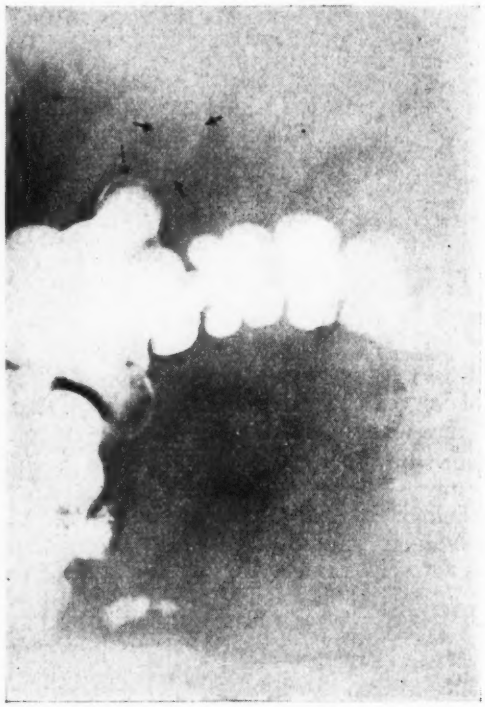

FIG. 21. Same case as Fig. 20, 12 hours after ingestion of first motor-meal and 3 hours after administration of a second. The first motor-meal must have left the stomach several hours before this picture was made as indicated by the barium in the transverse colon. Delayed emptying of this gall-bladder, therefore, is suggestive of some disturbance. Note the single negative shadow indicative of stone at the fundus. The other negative shadow, seen in Fig. 20 (upper shadow), has disappeared. This was due to gas in the descending duodenum. Note, also, that the fundus of the vesicle has been pulled up away from the hepatic flexure (dotted arrow), by contraction of the gall-bladder, indicating an active muscularis and definitely localizing the negative shadow within the gall-bladder.

stones or cholesterol crystals. These appear as darker spots in the dye-filled gall-bladder (Figs. 4, 13, 20, 21 & 27).

Stones cannot be excluded merely by noting diminution in the size of the gall-bladder shadow. So long as the muscularis is not impaired, contraction waves and reduction in size will occur. *It is therefore necessary to note shrinking to a very minute size.* With a gall-bladder shadow the size of a small pea it is quite safe to as-

*While manipulation under the fluoroscope is undoubtedly the most accurate means of localizing tenderness, we have found a sign which is especially valuable where splinting of the abdominal muscles prevents satisfactory palpation about the costal arch, and which, in our experience, has proved quite as accurate as sub-costal tenderness. Firm pressure is applied over the right costo-vertebral angle, the patient lying prone. Tenderness in this region is very frequently associated with gall-bladder disease.

Figure 25

Case No.	Visibility	Mottling	Tenderness	Emptying	Contractions	Mobility	X-Ray Diagnosis	Operative Findings
1	Good	None	None	Complete	Active	Free	Mucosa normal Muscularis normal No stones No adhesions.	Gall-bladder normal. not removed: Abortion
2	Good	None	None	Complete	Active	Free	Mucosa normal Muscularis normal No stones No adhesions; Duodenal ulcer.	
3	Good	None	None	Complete	Active	Free	Mucosa normal Muscularis normal No stones No adhesions.	
4	Fair	None	Marked	Incomplete	Weak	Limited	Large gall-bladder adherent,discolored;amorphous cholesterol in bile.Chronic cholecystitis with acute inflammatory changes.	Adhesions; extensive inflammation; precipitated cholesterol: Acute exacerbation of chronic cholecystitis
5	Poor	Doubtful	Marked	Incomplete	Fair	Free	Chronic cholecystitis or strawberry gall-bladder. No adhesions. Few cholesterol masses	Chronic cholecystitis. no adhesions. One cholesterol stone.
6	Poor	None	Slight	Complete	Active	Free	Chronic cholecystitis, No stones No adhesions.	Chronic cholecystitis. strawberry gall-bladder. No stones No adhesions.
7	Fair	None	None	Complete	Active	Free	Mucosa normal Muscularis normal No stones No adhesions.	
8	Good	None	None	Complete	Active	Free	Mucosa normal Muscularis normal No stones No adhesions. Appendicitis.	Gall-bladder normal. not removed; Sub-acute appendicitis
9	Good	None	Slight	Complete	Active	Free	Mucosa normal Muscularis normal No stones No adhesions.	
10	Poor	Two negative shadows	None	Incomplete	Active	Free	Chronic inflammation of mucosa most marked at distal half. No adhesions. Wall not fibrotic Two stones.	Mucosa inflamed: two ulcerated areas at fundus. Wall thickened. Numerous adhesions. Two stones.
11	Poor	Multiple negative shadows	None	Incomplete	Poor	Free	Chronic inflammation of mucosa,	Chronic inflammation of mucosa: strawberry gall-

sume that no stones are present (Figs. 9, 10, 11 & 12).

Frequently mottling simulating stones is caused by gas in the hepatic flexure or in the descending portion of the duodenum (Figs. 20 & 21, upper shadow). It is often impossible to exclude these factors without the assistance of fluoroscopic study. By manipulation under the fluoroscope the gall-bladder can be separated from the hepatic flexure and duodenum. The questionable shadows can thus be localized in their true position.

In many of these cases it may be necessary to make repeated examinations at intervals dur-

FIG. 22. Large negative shadow at fundus of gall-bladder caused by gas in loop at hepatic flexure. This cholecystogram was made after combined intravenous and oral administration of dye.

ing five or six hours following the motor-meal. Since the duct end of the gall-bladder is fixed, the vesicle rises towards the liver as it decreases in size. Thus it moves away from the hepatic flexure and duodenum and the mottling which is in the gall-bladder will move with it (Figs. 20 & 21).

Simultaneous examination of the stomach, duodenum and gall-bladder affords opportunity for appraising the value of a pressure defect of the duodenal cap as evidence of a diseased gall-bladder. This was formerly held to be fairly reliable indirect evidence of a "pathologic gall-bladder". While it frequently happens that a diseased gall-bladder may produce a pressure defect in the bulb, we have often found normal gall-bladders lying on one or another part of the duodenum or prepyloric antrum, with pressure defects corresponding to the size of the vesicle (Fig. 24). Even a normally distended cystic duct may produce such pressure. It appears that the hydrostatic pressure in a normally dis-

FIG. 23. Same case as Fig. 22, taken one week previously, after oral administration of dye. Note the great difference in size and density of these two shadows.

tended gall-bladder is greater than that ordinarily encountered in the duodenum.

We are of the opinion that too much dependence is generally placed upon the density of the gall-bladder shadow as the important criterion of cholecystograms in determining the presence of cholecystitis. While a dense gall-bladder shadow is generally indicative of a normal mucosa, the very density of the dye itself may obscure stones (Fig. 1). Moreover, there

FIG. 24. Cholecystogram taken 1 hour after ingestion of motor-meal. Note the pressure defect produced by this normal gall-bladder on the duodenal cap.

is a great range of variations of density within normal limits, the same patient often presenting on two different examinations gall-bladder pictures which differ markedly in their visibility and size (Figs. 22 & 23).

Faint shadows on cholecystograms do not necessarily indicate cholecystitis even if the dye has been administered intravenously. It will generally be found, however, that in these cases the gall-bladder contains much more dye than would appear from study of the cholecystograms. On examination of these patients in the upright position, under the fluoroscope, the density of the gall-bladder shadow will be seen to be much greater than appeared on the respective radiograms.

The interpretation of cholecystograms that are frankly positive or negative is, of course, a simple procedure. That confusion attends the diagnosis of the so-called "border-line" cases is explained by the fact that, aside from the actual demonstration of stones, no cholecystogram is pathognomonic of any definite gall-bladder disturbance.

A fair shadow may be seen in either normal or diseased gall-bladders. Complete emptying occurs normally, but it may occur in the presence of disease, as e.g., cholesterosis of the mucosa. Persistence of the gall-bladder shadow may occur in disease and it may occur when there is no morphological change.

While it appears that such inconsistent behavior on the part of the gall-bladder is not conducive to a study of its condition, it is obvious that a diagnosis must rest upon all the facts brought to light by all the means at our disposal.

In a study of cases recently begun, we have attempted to describe the condition of the serosa, muscularis and mucosa as determined by our combined method examination of the gall-bladder. Figure 25 shows the working chart used in tabulating observations, together with the results in the study of thirty cases. Of these, thirteen have been operated upon to date. Had we submitted as conclusions the general diagnosis of "pathologic gall-bladder" or "gall-bladder negative", our diagnoses as proved by operation would have been correct in one-hundred per cent. of those cases.

Our effort has been to describe the mucosa, the condition of the muscularis, the presence or absence of stones and of adhesions. On this basis, diagnosis was correct in ninety-four and two-tenths per cent. as checked by operation. Our greatest deficiency was our inability to determine the presence of adhesions in two cases with tender and more or less rigid abdominal walls.

The feasibility of such study is emphasized by the fact that complete fluoroscopic observations were made of the gall-bladder in a patient weighing three-hundred and twenty-five pounds (Figs. 9, 10, 11, 12).

When roentgenogram and fluoroscope show the gall-bladder, stomach and duodenum to be normal, the patient is returned the following morning for study of the colon and appendix. On more than one occasion have we found a "typical gall-bladder history" to be due to appendicitis.

The observations made from film and fluoroscope do not always sum up to give a definite conclusion as a simple arithmetical computation.

Figure 26 represents a diagnostic key containing the various radiographic and fluoroscopic possibilities together with their pathologic significance in terms of the morphological elements of the gall-bladder. By following these down the vertical columns the diagnostic significance is obtained, as:

"Good visibility", "fair visibility", "no mot-

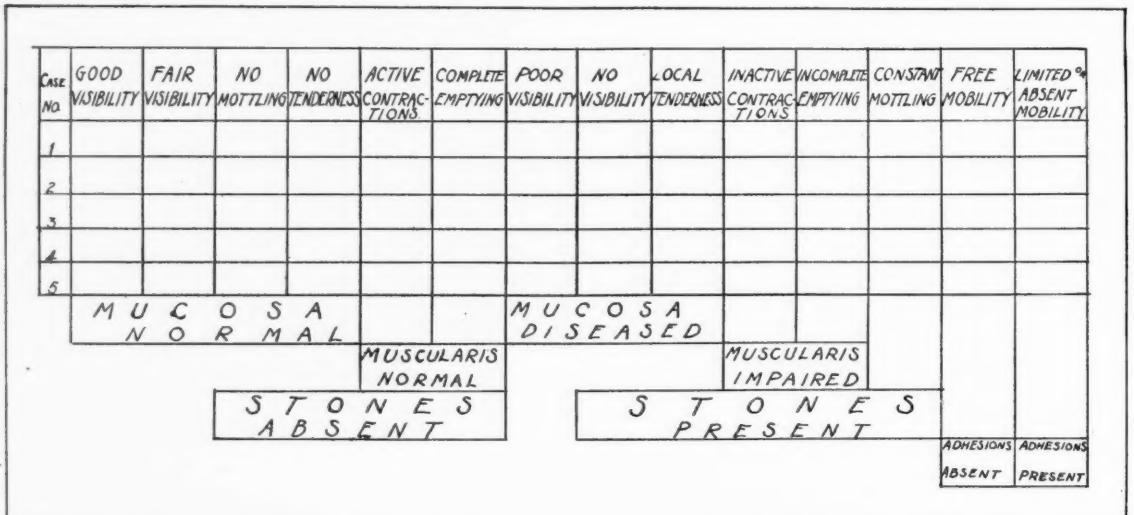

FIG. 26. A diagnostic key for cholecystography. Observations are checked (V) against case number in respective columns. By following these observations (V) down in vertical columns, their diagnostic significance is obtained, e.g., "no visibility" indicates "mucosa diseased" and "stones present."

tling'' and ''no tenderness'' point to a normal mucosa; whereas ''poor visibility'', ''no visibility'', ''local tenderness'', indicate a diseased mucosa.

''Active contractions'' and ''complete emptying'' indicate a normal muscularis; while ''inactive contractions'' and ''incomplete emptying'' suggest that the muscularis is impaired.

''No mottling'', ''no tenderness'', ''active contractions'' and ''complete emptying'' signify that no stones are present; whereas ''no visibility'', ''local tenderness'', ''inactive contractions'', ''incomplete emptying'' and ''constant mottling'' are diagnostic of stones.

''Free mobility'' means adhesions are absent; ''limited or absent mobility'' indicate adhesions are present.

It may be well to illustrate with a few cases taken from the list in Fig. 25, the application of the above key to gall-bladder diagnosis. Thus case No. 1, showed: ''good visibility'', ''no mottling'' and ''no tenderness'', indicating a normal mucosa; ''no mottling'', ''no tenderness'', ''complete emptying'' and ''active contractions'', indicating the absence of stones; ''active contractions'' and ''complete emptying'' show the muscularis to be normal. ''Free mobility'' indicates adhesions are absent. Hence the conclusion: mucosa normal, muscularis normal, no stones and no adhesions.

Case No. 4 showed: ''fair visibility'' and ''no mottling'', suggesting a normal mucosa. ''No mottling'' also suggests that stones are absent. ''Marked local tenderness'', however, suggests that the mucosa is diseased and that stones are present. ''Incomplete emptying'' and ''weak contractions'' both point to an impaired muscularis and the presence of stones. ''Limited mobility''shows the gall-bladder to be adherent. Weighing the evidence we, therefore, conclude that the mucosa and muscularis are diseased, that there is precipitated cholesterol in the bile and that the vesicle is bound down by adhesions—chronic cholecystitis. Knowledge of the clinical aspects of the case enables us to infer the presence of an acute exacerbation.

Case No. 30 showed: ''good visibility'' and ''no tenderness'', indicating the mucosa to be normal. ''No tenderness'' also suggests that stones are absent. ''Active contractions'' indicate the muscularis to be normal. They also point to the absence of stones. However, ''incomplete emptying'' suggests that the muscularis is impaired and that stones are present. ''Free mobility''shows adhesions to be absent. ''Constant mottling'' (many negative shadows) offers irrefutable evidence that stones are present, and the presence of stones readily accounts for the incomplete emptying. Having seen the gall-bladder actively contracting under the fluoroscope, we believe the muscularis to be normal. Thus we conclude: mucosa normal, muscularis normal, many cholesterol (soft) stones, no adhesions.

EVALUATION OF FINDINGS

In the order of its importance as diagnostic data the most definite finding is constant mottling, indicating stones.

However, if the gall-bladder can be made to contract to minute size (Figs. 9, 10, 11 & 12), it is quite definite that stones capable of producing symptoms are absent.

If, when the stomach has emptied, the gall-bladder has failed to contract, a second motor-meal may be given without the barium. If no further reduction in size can be induced, the cause is probably stones or advanced inflammatory changes impairing the musculature (Figs. 14, 20, 21).

No visibility of the gall-bladder after the intravenous administration of the dye means that the gall-bladder may be more or less filled with stones and the cystic duct occluded or that the mucosa and muscularis are seriously diseased, or both. The pathological state of the liver is not an accountable factor since good cholecystograms have been obtained experimentally after the destruction of one-half of the liver by chloroform[7].

If the gall-bladder is freely movable under the fluoroscope, it is quite safe to assume that perivesicular adhesions are absent. In a case of duodenal ulcer, where adhesions to the gall-bladder may have been expected, the simultaneous examination of both these organs permitted a preoperative forecast that no adhesions would be found. This was confirmed at operation.

Limited mobility, if definite, is a valuable sign in determining the presence of adhesions.

Local tenderness is always valuable as a clinical sign, but it comes within the province of the roentgenologist because he has a distinct advantage in localizing the exact tender area.

Faint contractions of the gall-bladder occur when there have been considerable involutionary changes in the muscularis. In the absence of a definite pathological entity they may not infrequently be explained by the general gastro-intestinal sluggishness of the patient.

The activity of contractions is not impaired by the presence of stones *per se,* unless the gall-bladder is actually distended with them. Frequently one may see small, non-faceted stones re-arranged in groups of varying shapes corresponding to the phase of gall-bladder contraction. In the resting stage the stones may be grouped in a semi-circle at the fundus. During an expulsive contraction a few hours after the motor-meal the stones may be lined up in a vertical row (Figs. 4 & 27). It is during such a phase that a stone is most likely to be pushed beyond the ampulla into the cystic duct.

SUMMARY AND CONCLUSIONS

The determination of the presence or absence of gall-bladder disease, based upon information derived from the usual cholecystographic examination, is frequently not founded upon adequate and conclusive evidence. Often it permits only of vague and general conclusions.

The modifications recommended and the new methods and observations introduced afford opportunity for more accurate and detailed description of the exact state of the gall-bladder.

Care and deliberation are essential, beginning with the preparations for administering the dye and attending every step to the final interpretation.

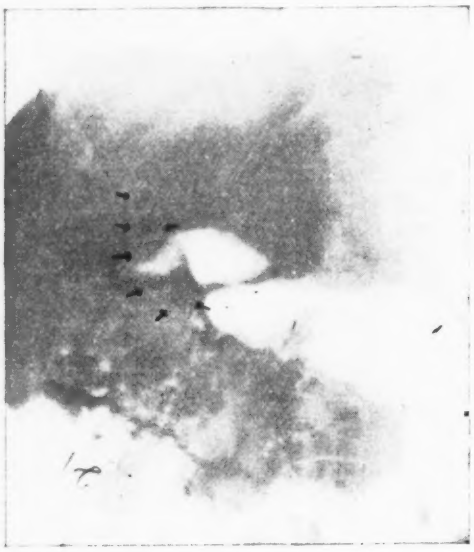

FIG. 27. Same case as Figs. 3 and 4, 2 hours after ingestion of motor-meal. The gall-bladder has contracted, arranging the stones in one vertical line. The presence of barium in the duodenum proved that these negative shadows were not due to gas in the descending portion of the duodenum.

The combined oral and intravenous administration, by producing greater density of the gall-bladder shadow than the oral method alone, and by being singularly free from any of the reactions which may follow a full intravenous or a full oral dose, permits of accuracy without discomfort.

Fluoroscopic examination is of great value as a supplement to the roentgenogram in a study of the resting gall-bladder. It is of prime importance in studying the dynamics of the gall-bladder.

Since gall-bladder contraction varies with the kind and amount of food eaten, it is essential to minimize this variable factor by establishing a definite motor-meal. To this we add barium sulphate so that we may observe the stomach and duodenum at work in company with the gall-bladder.

During filling the gall-bladder assumes a passive rôle. Concentration is accomplished by physical and probably vital processes of the mucosa. Emptying takes place, upon reception of the proper stimulus, only by activity of the muscularis.

As seen under the fluoroscope, the activity of the muscularis combines intermittent wave-motion and expulsive contractions with simultaneous tonic contractions. The latter show a remission to successively higher levels at the completion of each contraction cycle. Thus the gall-bladder is reduced in size.

No single roentgenographic finding is pathognomonic of any particular gall-bladder disturbance excepting the demonstration of stones. Full proof of the absence of stones is obtained only by observing complete contraction and emptying of the gall-bladder.

The diagnostic key above described is not offered as a short-cut to gall-bladder diagnosis. It purports to show the significance of each observation and the manner in which conclusions are reached. The relative value of the roentgenographic and fluoroscopic findings is subject to variations occasioned by the consideration of each case.

The examinations necessary for obtaining the data to use with this chart cannot but tend toward more careful and detailed study of the gall-bladder.

In appreciation of the many courtesies shown us during this work we wish to express our thanks to Dr. S. W. Ellsworth, Roentgenologist, and to Dr. A. W. Rowe, Chief of Research Staff, of the Massachusetts Memorial Hospitals and the Evans Memorial for Clinical Research and Preventive Medicine.

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CHANGING CAUSES OF DEATH*

BY GEORGE H. BIGELOW, M.D.,† AND ANGELINE HAMBLEN, A.B.†

EVERYTHING is changing, clothes, habits, morals, tastes. So in the realm of sickness changes have occurred. The average person dies later since fewer die young. Since we die at different ages than formerly we might expect a difference in the diseases from which we die most frequently. If these most frequent causes of death are unavoidable in view of our present knowledge, the community cannot be blamed. If, on the other hand, these most frequent causes are avoidable, the community stands indicted. This seems a way of judging the ability of modern man so to organize his community resources that he may profit practically from such knowledge as he now possesses.

To study this we have totaled the deaths in Massachusetts for a three-year period 1925-27 and have indicated the order of the frequency of the first ten causes of death for all ages and in certain age groups (see chart). Then in the next two columns we have indicated where each disease occurred in order of frequency in 1915-17 and 1905-07, in order to note progress or regression. For simplicity we will hereafter indicate these three year averages by the middle year, i.e., '06, '16, '26. It may be said that in certain instances over the twenty-year interval studied a disease may be climbing higher in the frequency list while the total deaths from the particular disease may be actually decreasing. True, but we feel that in those diseases where we have specific knowledge as to treatment or prevention the effective utilization of this knowledge is better judged by the frequency of the disease in question in relation to others about which we are still ignorant in these matters even more than by its absolute prevalence. However in order to give some idea in regard to this matter we are including a table of death rates for the ten most frequent causes of death for all ages.

LEADING CAUSES OF DEATH BY AGE GROUPINGS

AVERAGE - - - THREE YEARS

	Under 1 yr.			1-4 yrs.			5-9 yrs.			10-14 yrs.			15-19 yrs.			20-29 yrs.			30-39 yrs.			40-49 yrs.			50-59 yrs.			60-69 yrs.			70 and over			Total		
	1926	1916	1906	1926	1916	1906	1926	1916	1906	1926	1916	1906	1926	1916	1906	1926	1916	1906	1926	1916	1906	1926	1916	1906	1926	1916	1906	1926	1916	1906	1926	1916	1906	1926	1916	1906
Prematurity	1	1	*																												8	9	*
Pneumonia	2	3	4	1	1	1	3	5	4	4	6	4	4	4	4	5	5	3	3	3	2	4	4	3	5	3	3	5	4	4	6	4	3	3	2	3
Malformations	3	5	10																																	
Diarrhea and Enteritis	4	2	2	6	2	4																												10	7	5
Congenital Debility,etc.	5	4	* 1																																	
Whooping Cough	6	8	9	7	8	12																														
Diseases of the Thymus Gland	7	**	**																																	
Tuberculosis	8	7	3	3	4	2	5	3	3	3	3	1	1	1	1	1	1	1	1	1	1	3	1	1	6	6	4	9	7	6				6	3	1
Bronchitis	9	6	7																																	
Measles	10	15	16	4	6	11																														
Accidents				2	5	6	1	2	2	1	1	2	2	2	2	2	2	2	4	4	4	6	6	6	7	7	7	6	8	8	7	7	10	7	8	9
Diphtheria				5	3	3	2	1	1	7	4	6																								
Scarlet Fever				8	11	13	7	6	8																											
Influenza				9	15	22																									10	10	11			
Meningitis				10	7	5																														
Heart Disease							4	4	6	2	2	3	3	3	3	4	3	4	2	2	3	1	2	2	1	1	1	1	1	1	1	1	1	1	1	2
Appendicitis							6	7	10	5	5	10	5	5	8	7	8	13	8	11	18	10	14	22												
Diseases of the ear							8	34	•	8	23	37	9	33	•																					
Nephritis							9	11	9	6	7	11	6	6	6	6	6	5	7	5	5	5	5	5	4	4	6	4	5	5	5	5	5	5	6	8
Anterior Poliomyelitis							10	8	**																											
Epilepsy										9	14	15	9	10	20	10	13	16																	
Rheumatic Fever										10	10	9																								
Puerperal State													7	7	11	3	4	6	6	7	7														
Cancer													10	13	39	9	10	14	6	6	6	2	3	4	2	2	2	2	2	3	3	6	6	2	4	7
Suicide																8	7	10	9	8	11	8	8	8												
Apoplexy																			10	9	8	7	7	7	3	5	5	3	3	2	2	2	2	4	5	6
Alcoholism																						9	12	11												
Diabetes																									8	6	8	6	9	11	9	12	21			
Angina Pectoris																									9	13	10	10	10	13	8	11	17			
Diseases of the Arteries																									10	9	7	7	6	9	4	3	7	9	10	15

*Congenital Debility includes Prematurity in 1905-1907
**Not listed
•Average less than 1 per year

To note progress or regression. For simplicity we will hereafter indicate these three year averages by the middle year, i.e., '06, '16, '26. It may be said that in certain instances over the twenty-year interval studied a disease may be climbing higher in the frequency list while the total deaths from the particular disease may be actually decreasing. True, but we feel that in those diseases where we have specific knowledge as to treatment or prevention the effective utilization of this knowledge is better judged by the frequency of the disease in question in relation to others about which we are still ignorant in these matters even more than by its absolute prevalence. However in order to give some idea in regard to this matter we are including a table of death rates for the ten most frequent causes of death for all ages.

As one looks at the chart in which the diseases have been roughly arranged in descending order of frequency with ascending age groups the drift of causes of death with ascending age groups is quite apparent. Pneumonia is the only disease that keeps its place in the first ten from the cradle to the grave. A further study of the pneumonia figures indicates an increase in its prominence in the younger and a corresponding decrease in the older age groups. Next to pneumonia, tuberculosis and accidents appear most frequently throughout the chart, the former being absent only in the oldest and the latter only in the youngest ages. In tuber-

*From the Massachusetts Department of Public Health.

†Bigelow—Commissioner of Public Health for Massachusetts. For record and address of author see "This Week's Issue," page 245. Hamblen—Statistician, Massachusetts Department of Public Health, 1920. For record and address of author see "This Week's Issue," page 245.

culosis we can take satisfaction only in its depressed position in the younger and older ages though in the "total" column it is seen that over the twenty years this has dropped from first to sixth place. Twenty years ago but one, heart disease, of the degenerative diseases appeared among the first five of the total causes of death, while now all but one, pneumonia, of the first five total causes are degenerative diseases.

Under one year prematurity is still at the head. Since prematurity, malformation and congenital debility have increased from 31 per cent. to 47 per cent. of all deaths it means that almost half of these infants never even had a fair start. Pneumonia, whooping cough and measles are becoming more prominent as causes of death. Diarrhea and tuberculosis have fallen off, which is as it should be.

In the age group 1 to 4, 58 per cent. of all deaths in 1925-27 were due to communicable diseases and 11 per cent. to accidents. The latter reflects the increasing importance of the automobile. Pneumonia remains threateningly at the head of the list; measles and whooping cough have climbed markedly; tuberculosis shows a slight drop but less than under 1; while diphtheria and diarrhea both show a more favorable drop.

In the age group 5-9, the grammar school group, accidents and diphtheria vie with each other as principal cause of death. Both are indictments of our civilization, but the greater is diphtheria since it is certainly easier to administer toxin-antitoxin than to solve our hideous tangle of transportation. Tuberculosis has dropped somewhat.

In the age group 10-14, accidents are still at the top and heart disease has climbed. For the last time for many a column tuberculosis shows a decline. Diphtheria holds about the same relative place as in 1905-07. Think of it! In twenty years not much relative improvement in diphtheria, and yet how much more we know. In 1915-17 diabetes ranked eighth while now it is thirteenth. From the ages 5 to 50 appendicitis ranks as one of the ten first causes of death and its importance in each age group has been increasing in the last twenty years.

In the age group 15-19 tuberculosis is first of the causes of death and remains so till the age 40. Yet some would have us believe that we have conquered tuberculosis. In this age group in 1925-27 it caused 28 per cent. of all the deaths. All the more important causes in this group are relatively constant, so that advance in knowledge has not altered their place. Cancer appears for the first time and is on the increase over the years. Heart disease, nephritis and cancer, commonly considered diseases of old age, caused 16 per cent. of all deaths in this age group in 1925-27. Typhoid had fifth place in 1905-07, eighth place in 1915-17, and is now in the eighteenth place, which is as it should be.

In the age group 20-29 tuberculosis leads, causing 34 per cent. of all deaths in this group in 1925-27. Accidents and suicides caused 14 per cent. Cancer is coming up. Typhoid fever was seventh in 1905-07, ninth in 1915-17, and is now in twentieth place. Epilepsy is coming up here as in the age groups 15-19. It does not appear on the chart again.

In the age group 30-39 again tuberculosis leads, causing 22 per cent. of all deaths in this group in 1925-27. Heart disease, cancer, nephritis and apoplexy caused 26 per cent. Surely we are wearing out too soon.

In the age group 40-49 in 1915-17 the causes that ranked ninth and tenth were diabetes and general paralysis of the insane while they are now in the fifteenth and eleventh places respectively. In 1905-07 the causes that ranked ninth and tenth were typhoid fever and general paralysis of the insane, and they are now in the forty-first and eleventh places respectively. From 40 on heart disease was the first cause of death during the last three years. In this age group it caused 15 per cent. of all deaths. From now on heart disease has asserted its ascendency. Except for over 70, cancer holds second place. From now on, tuberculosis drops but does not disappear from the chart till over 70. This shows clearly that our gains in tuberculosis have been among the young and old. In 1915-17 diabetes was ninth and in 1905-07 typhoid was ninth. These diseases in this group now occupy the fifteenth and forty-first places respectively.

In the age group 50-59, again heart disease and cancer lead, causing 37 per cent. of all the deaths in 1925-27, with pneumonia dropping in this and subsequent age groups. Diabetes has not changed its place over twenty years. We are now reaching the age groups that show an increased death rate over the twenty-year period.

In the age group 60-69 in 1905-07 the causes that ranked seventh and tenth were paralysis without specified cause and bronchitis. In 1925-27 heart disease caused 21 per cent. and cancer 17 per cent. of all deaths. The degenerative diseases certainly lead here. Over the twenty years diabetes has come up and tuberculosis has gone down.

In the age group 70 and over in 1915-17 the causes that ranked eighth and ninth were bronchitis and senility. In 1905-07 the causes that ranked fourth, eighth and ninth were senility, bronchitis and paralysis without specified cause. In 1925-27 heart disease caused 29 per cent. of all deaths and apoplexy 15 per cent. It would be interesting to know why pneumonia has gone down. Again diabetes shows an increased prominence.

CONCLUSION

In all this study of the relative prominence of the causes of death in different age groups over twenty years what is favorable and what un-

favorable as regards application of such knowledge as we have?

Favorable

(1) The fall in tuberculosis under 15 and over 40 years making it now sixth instead of first among total causes of death.

(2) The marked drop in diarrhea and enteritis in the first five years, placing it as tenth among total causes, instead of fifth, as twenty years ago.

(3) The decrease in diabetes from 10 to 50 years.

(4) The complete obliteration of typhoid from a place in the first ten causes of death in any age group in 1925-27.

Unfavorable

(1) That prematurity, malformation and congenital debility have increased and now cause 47 per cent. of all deaths under 1 year.

(2) The prominence of accidents from 1 to 50 years, and of suicides from 20 to 40 years.

(3) The increase in the prominence of measles and whooping cough in the age group 1 to 4.

(4) The inexcusable prominence of diphtheria from 5 to 14 years.

(5) The constantly increasing prominence of appendicitis over the twenty years in all age groups from 5 to 50.

(6) That tuberculosis should be the principal cause of death from 15 to 40.

(7) The increasing prominence of cancer from 15 years on.

(8) The constant position of diabetes in the age group 50 to 59, and its increasing prominence thereafter.

(9) The absence of improvement in the total death rate over 50.

DEATH RATES FOR ALL AGES OF THE TEN MOST FREQUENT CAUSES OF DEATH

	1926*	1916*	1906*
Heart Disease	226	210	186
Cancer	126	105	84
Pneumonia	114	172	177
Apoplexy	103	97	95
Nephritis	83	93	75
Tuberculosis	80	142	211
Accidents	68	75	69
Prematurity	44	59	.....
Diseases of the Arteries	44	58	24
Diarrhea and Enteritis	20	80	99
Total Deaths All Causes	1219	1483	1676

Rates per 100,000

*Average three years.

UNDULANT FEVER

BY EDWARD A. LANE, M.D.*

UNDULANT fever is one of several names, such as Malta fever, Mediterranean fever, melitensis septicemia, which has been used to designate a morbid condition characterized by prolonged fever. This morbid condition may be caused by any one of a group of closely related organisms distinguishable only by laboratory tests and called "Brucella" after Sir David Bruce, discoverer of the first recognized member of the group. Bruce first gave a complete description of this microbe in 1893 and suggested the name "micrococcus melitensis".

In 1918 Alice Evans demonstrated the close similarity of the bacterium abortus shown by Bang in 1897 to be the cause of contagious abortion in cattle, to Bruce's "micrococcus melitensis", the cause of Malta fever in man. This drew attention to the possibility of infection with bacterium abortus in man.

The confusion which has arisen in connection with the nomenclature of the Brucella group of organisms is reflected in the lack of uniformity in the use of the various names used to designate their clinical manifestations. Clinically identical, differentiation can only be made by identifying the causative organism, and this, as has been said, can be done only by special laboratory tests. Cases due to infection with Brucella abortus have commonly been called undulant fever. The name Malta fever has usually been reserved for cases infected with Brucella melitensis. Both undulant fever and Malta fever may be and have been used as inclusive terms to cover the *clinical manifestations* of all of the Brucella group of organisms.

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INCIDENCE

Malta fever is less prevalent in the United States than is undulant fever and has been confined for the most part to Arizona, Texas, and New Mexico. The first case was reported by Craig in 1905, since which time 160 cases are known to have occurred in the states just mentioned.

Undulant fever, on the other hand, has been reported from all sections of the country. The first case was recognized by Keefer in Baltimore in 1924. Since that time, approximately 1300 cases have been reported from forty-three states.

In Massachusetts, the first known case of undulant fever was recognized in Worcester in 1928. Since then, thirteen additional cases have been discovered. In two of these, infection was contracted outside the State, while two of the others were laboratory infections. The distribution of the remaining nine by place of probable

infection is as follows: Attleboro, 1; Whitman, 1; Fitchburg, 1; Great Barrington, 1; Lowell, 1; New Marlborough, 1; Worcester, 1; Winchendon, 1; Cape Cod, 1.

EPIDEMIOLOGY

Undulant fever apparently occurs much more frequently in males than in females.

It is much more common in middle life than it is in childhood or old age. In fact, it has rarely been found in children under 12.

The distribution of infection with various varieties of the Brucella group of organisms is world wide.

A number of different kinds of animals have been reported as susceptible to or carriers of one of the Brucella group, the most important of which are goats, cattle, and swine.

The causative organisms have been found in the blood, urine, and feces of patients. Infection is supposed to take place usually by way of the alimentary tract and this appears to be due most commonly to the drinking of raw, infected milk. Contact with diseased animals, more especially swine, is another probable mode of infection.

CLINICAL DIAGNOSIS

Unfortunately, the bedside diagnosis of undulant fever is frequently extremely difficult or impossible. While a prolonged, undulating fever is the most characteristic symptom, it is not always undulant in character and may be transient. The non-undulant type of fever occurred in sixteen of a series of forty-five cases reported recently in New York State. In a typical case, the febrile attacks may last for one or more weeks and be separated by periods of absolute or relative apyrexia of two or three days' duration.

Hughes recognizes three classes of cases:

1. A pernicious type, rare and generally fatal within one to three weeks.

2. An undulant type characterized by exacerbation of temperature at regular intervals over a prolonged period, occasionally up to a year or more.

3. A continued type with continuous low grade fever persisting for weeks or months.

There is also the mild "ambulatory" case which shades off into the healthy carrier condition.

In addition to the fever, some of the more common but by no means constant signs and symptoms are enlargement and tenderness of the spleen, rose spots, profuse sweating, muscular and joint pains, progressive anemia, and prostration.

In New England, the disease will have to be differentiated most frequently from typhoid fever, tuberculosis, acute rheumatism, malignant endocarditis, and influenza.

LABORATORY EXAMINATIONS

Because of the lack of any constant, definite clinical criteria, the diagnosis will often have to be made by exclusion with reliance upon laboratory tests for final confirmation. In all cases with prolonged fever in which the cause of the illness is not definitely known, a blood examination should be made.

The agglutination reaction commonly found after the second week, while not as conclusive as the blood culture nor as reliable perhaps as in typhoid fever, is nevertheless valuable diagnostic evidence. There is no unanimity of opinion with regard to the minimum dilution of blood for a positive interpretation of the agglutination test. In view of this fact, the Department is, for the present, considering a positive agglutination reaction with a minimum dilution of 1:80 as of diagnostic significance if clinical symptoms are consistent. The positive agglutination reaction may persist after apparent recovery for from a few months to a year or two.

As has been mentioned above, the causative organism has been isolated from the blood, urine and feces, as well as from other body fluids and tissues. It is said that the blood is more likely to contain the organisms if taken during a febrile attack.

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NEW ENGLAND SURGICAL SOCIETY

THE GRAHAM TEST*

BY EDWARD L. YOUNG, JR., M.D.†

TWO years ago I presented before this Society a study of end results in a series of cases which were classified as chronic cholecystitis in the hospital records. In this series only 63% were entirely cured by operation, the chief cause of failure being mistaken diagnosis which in these cases had been made on clinical evidence only. The x-ray aided only in so far as it helped rule out difficulties in the gastro-intestinal or urinary tract. Since the time when these cases were studied, cholecystography has taken its place as a valuable adjunct in the study of biliary tract disease but like most tests, however valuable, it cannot be the absolute criterion to determine the condition of the gall-bladder in any case, and like all tests, it takes several years of trial by error to determine its real position in the diagnostic field. In the past two or three years, during my months of service at the Massachusetts General Hospital, in frequent consultations on the medical side, it has happened a number of times that a case would not have a Graham test where it seemed to be indicated and the medical house staff has with increasing emphasis expressed a distrust of the test so great that they did not care whether it was done or not. This feeling has not been entirely absent among the medical visiting staff. It seemed to me worthwhile to check up on a series of cases from the hospital records as nearly similar as possible to the other series in an attempt to find out whether this new test had helped or hindered in the accuracy of diagnosis. As this work has gone on, it has been evident that it would not give as much clean-cut evidence as was hoped but the results seem to me to justify presentation for discussion.

I took from the x-ray department all of those cases where the Graham test had been done during one year. This included 282 cases. I went over the cards and at once discarded 48 cases where there had never been any suggestion at all of biliary tract disease where the test had been done for some other purpose. There were, for instance, a number of cases of arthritis where the physicians were hunting for some focus of infection, however remote. There was one short series of cases of diabetics where the desire had been to see if there was any x-ray evidence of gall-bladder disease not indicated in the symptoms. There were also a certain number of cases of peptic ulcer where it was desired to see if the presence of ulcer was interfering with gall-bladder function. These did not seem to meet the requirements of the study I was undertaking. Of the remaining cases, 84 had end results given in the hospital records themselves in the shape of operation done either at the Massachusetts General Hospital or reported from other clinics. Letters were sent to the remaining unoperated cases asking if there had been any further symptoms of pain, digestive upset, or any type of distress suggesting gall-bladder trouble, or whether there had been any treatment since leaving the hospital for gall-bladder or liver disease or digestive upsets. From these I received 60 replies detailed enough to justify considering in this report. This gives 144 cases on which to base results. Before going on to the figures, there are two statements that are necessary to qualify the premises. The administration of the dye was in most of these cases by mouth. In a certain percentage it was given intravenously and in some of these the intravenous was given to check an unsatisfactory test following the oral administration, but I have not differentiated in this review. A number of these tests were reported unsatisfactory but with a suggestion by the x-ray man toward disease or no disease as the case might be. In many of these, another test was requested by the x-ray department which never took place. I have included these reports not under unsatisfactory but under their suggestion of disease or no disease, which may not be entirely fair to the x-ray department.

Of the 144 end results we will consider first the operative cases, 84 in number. The Graham test was positive in 54 of these cases and of these 41 were proven to be correct at operation. Of the 13 remaining, 6 showed other disease which almost certainly accounted for the positive findings, 3 carcinoma of the liver, 2 peptic ulcer, and 1 cirrhosis of the liver. Seven showed no gross evidence of biliary tract disease nor any other condition sufficient to account for the x-ray findings. Of these 7, one reports that the removal of the gall-bladder has resulted in the complete relief of her symptoms. This one case is interesting in backing up Graham's report that relief followed the removal of the gall-bladder in every case where the Graham test had been positive regardless of the gross appearance of the gall-bladder at operation.

There were 28 cases where the Graham test was negative and the patient was operated on either in spite of the x-ray or for some other condition. In 19 of these 28 cases, there was no biliary tract disease so far as could be determined. One of these 19 cases reports that the same symptoms have persisted since and she has

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not been able to get any relief from any form of treatment. In 9 of the 28 cases, the gall-bladder was found to be diseased in spite of a normal function according to the Graham test. In 7 of the 9 cases, the disease consisted in a normal feeling gall-bladder but the presence of small stones. In 2 cases the gall-bladder was grossly thickened. Two of the 84 cases only were reported unsatisfactory without any leaning on the part of the x-ray man toward disease or health. Both were found diseased at operation.

If we change these figures to percentages, 76% of the cases showing a positive test were proven to be correct and 12% more actually correct in the face of the real diagnosis, leaving only 12% actually wrong according to the operative evidence. Where the test was negative, 68% were right and 32% were wrong.

Sixty unoperative cases reported by letter and of these, 39 seemed to confirm the result of the cholecystography. Thirty-two cases had negative x-rays and have had no further evidence of gall-bladder disease. Seven had positive Graham tests in the hospital and their symptoms had continued. Twenty-one cases seemed to disprove the test in their course in the past 3 years. Thirteen of these had a positive test, 2 have since proven to have cancer in the liver, and 1 has been cured by the removal of a diseased appendix. One has been helped by treatment of a peptic ulcer. The other 8 reported that the symptoms of which they complained in the hospital have entirely disappeared. Eight had negative x-rays and there has been a persistence of symptoms similar to those for which they were studied although none of these have had enough trouble to send them for operation. I am well aware that these 60 cases cannot be taken too seriously as the persistence or absence of symptoms alone cannot prove that the original x-rays were right or wrong.

In addition to these figures, I want to add 12 cases in my own practice where in the last three years I have felt justified in operating in the face of a negative test. In 11 of these, gall-bladder pathology was found. In 8 of them, small stones were found in a gall-bladder which was thin walled and grossly might well have had a normal function. Two of the others showed recent adhesions corresponding to the attacks which they had had. One of them showed a gall-bladder so badly diseased that it did not seem possible that it could have functioned. This was in a woman of 59 who had had a very indefinite story for several years. For a year and a half before I operated, she had had careful studies and 3 Graham tests had shown a gall-bladder filling well, smooth in outline, and emptying well after a fat meal. Operation showed a very thick walled, porky gall-bladder. The pathological report is as follows: "Specimen consists of a gall-bladder grayish green in color; walls are firm, whitish, and very thick, measuring .8 cm. Two very small cholesterin stones. Mucosa shows slight thickening, is quite irregular in outline. Sections microscopically show the wall to be markedly thickened. Numerous areas of round cell infiltration are seen. Numerous gland structures are seen many of which are situated deep in the wall. Blood vessels are thickened and show marked congestion. A few areas show polymorphonuclear infiltration." This one case alone shows that normal function is possible with a grossly diseased gall-bladder.

These figures seem to show that there is possibly a considerable chance for error in the Graham test. A positive test which is wrong may subject the patient to an unnecessary operation and a negative test as in the case just quoted, may keep the patient from having a very necessary operation and both prolong the time of suffering and also prolong the convalescence when the operation is done.

There are several factors in this test which must be borne in mind if we are to get the most aid from it. First and most important must be the recognition that this is a test of function and not of disease and that although we expect that disease will result in an upset function, cases here reported prove that this is not always so. It is also proven that normal physiology may be interfered with by abdominal pathology elsewhere than in the gall-bladder. This is well shown by the cases here where peptic ulcer, carcinoma of the liver, and cirrhosis of the liver all gave a positive test but other cases of peptic ulcer gave negative tests as did one case which later proved to be carcinoma of the liver.

There are at least two types of stone formation, one due to infection and one to the hypercholesterinemia such as exists, for instance, during pregnancy. In this latter condition, the gall-bladder itself may be little if any damaged in the early stages and it is not uncommon in these cases for the test to show a normal function, and if the stones are small, they may be entirely missed. I believe this is one of the commonest conditions in which the clinical evidence is at variance with the test and where the symptoms may be so definite that there need be little hesitation in advising operation. The skill of the roentgenologist and his willingness to advise and carry through several tests in doubtful cases is a very important factor. It may take a great deal of detailed work before the test is entirely satisfactory. I saw one excellent example last year in the following case:

A woman of 48 had suffered for years from asthma and had, even on cross-examination, only the vaguest possible symptoms of biliary tract disease. Nevertheless, in his repeated studies of her, Dr. Rackemann had come to feel that there was trouble there. Two Graham tests showed a beautiful shadow which behaved in a normal fashion. Insistence on a third test showed a beautiful picture of a gall-bladder containing stones which was verified at operation. Just

why it should have showed on one occasion and not on two others is not clear.

In some of these cases studied where there was reason to believe that the dye might not have been absorbed when given orally, the intravenous test was used, but in no case in this series did the intravenous administration of the dye reverse any result obtained by the oral administration. This, together with higher error in negative tests, seems to disprove any marked superiority of the intravenous method of administration. The figures here given emphasize what I believe we have all come to feel, that the Graham test like every single test that we have, cannot be taken at its face value if it is not supported by clinical evidence, that there is a large percentage of error depending to a certain extent on the skill and perseverance of the roentgenologist but to a certain extent entirely unavoidable and that because the test measures function, it may entirely miss the presence of stones, or in certain cases, more serious damage to the gall-bladder itself. That it is a valuable addition to our diagnostic armamentarium cannot be denied but it must always be backed up by the clinical evidence except in those cases where it will show clean-cut negative shadows which can be nothing but gall stones and which may be present without symptoms.

CONCLUSION: The Graham test, because it measures function only, may not show the presence of disease and clinical evidence, if in opposition, should always take precedent.

A positive test is of more value than a negative test.

The use of the test increases the accuracy of diagnosis.

Discussion

Dr. Horace Sowles, Boston, Mass. (By invitation): I have very little to say in addition to what Dr. Young has already said except we thought it might be interesting to compare the statistics of some other clinics with these figures we have from the Massachusetts General Hospital, and I am prepared to give you just briefly a few figures from the Beth Israel Hospital for which I am indebted to the courtesy of Dr. Robbins, who is the head of our x-ray department. Dr. Robbins has recently reported one thousand Graham tests by oral administration. The only ones that are of any value to us in this present discussion are those on which we have the results of an exploration, in other words, the operative findings, to check up the diagnosis.

Out of 1000 cases there were 512 pathological Graham tests, and of these, 182 came to operation so that we have the operative report. Of these 182 cases, 157 showed pathology in the gall-bladder and that is 86.3 per cent. correct, which corresponds very closely to the 88 per cent. in the Massachusetts General Hospital records.

I didn't make any attempt to communicate with those cases who had a normal Graham test or those who had a pathological Graham test, but as far as we knew, had not come to operation.

I think these findings confirm our clinical impressions on the subject and in a way they justify our clinical actions, because I think we have all given a good deal of weight to a positive Graham test and in the presence of it we have advised exploration even though the clinical picture does not seem to be quite complete. On the other hand, in the presence of a normal or negative Graham Test, I think we are justified in ignoring it provided our clinical picture is otherwise typical of gall-bladder disease.

Dr. Daniel F. Jones, Boston, Mass.: I don't know of any more difficult question to discuss than the question of Graham Test. In the first place, we all differ as to what makes a chronic gall-bladder. The percentages are going to differ with different clinics and with the surgeon, and, therefore, it is rather hard on the x-ray man for me to decide whether he is right or not, as I refuse to call a case chronic cholecystitis unless I can convince myself by clinical evidence, while others are willing to accept the diagnosis without any clinical evidence.

Graham himself showed me a case on which he and his roentgenologist could not agree on the concentration of the dye, it was so slight. Graham believed it to be a chronic cholecystitis and operated. He was quite sure of the chronic cholecystitis, while I was not. How can you discuss the question under the circumstances?

I think it is very wrong to get it into your head that the Graham Test is of no value. I think some medical men are getting into the attitude that you don't need it. I think it is too bad, because it is like all laboratory work, you should get all of it you can get to help you out and then give it its proper value.

I can't discuss this paper very well because the figures as read are rather confusing. Eighty-six per cent. of correct diagnosis is very good.

I think it is a great pity not to use the Graham Test in certain cases. The error, if there is an error, is made in operating upon patients with very few symptoms and in which the Graham Test is rather indefinite. Perhaps the gall-bladder doesn't empty quite so well as it should. A great many of these cases are being operated upon unnecessarily or in an unnecessary hurry. A great many of them could wait for time to see what is going to happen on diet and care, and whether the symptoms will improve or not. Except in a very few old people, to whom time is important, there is not the slightest hurry and I am sure that delay for a few months with proper treatment would prevent many cases of so-called chronic cholecystitis from being operated upon. The Graham Test is rarely questioned in older people; they usually have gall stones and real chronic cholecystitis, which

can be easily distinguished at operation. The symptoms are also definite.

You must remember that a great many of the cases go to the family physician with a rather indefinite digestive story, perhaps a little headache or discomfort after eating, and most of us would hate to have our gall-bladder taken out because we felt a little full or uncomfortable after eating a good dinner and without any other definite symptoms.

I think the most important point is that in the great majority of these cases we can easily wait if the diagnosis is uncertain. A year or two years might make a great difference in the symptoms and might give you an entirely different picture according to the x-ray.

I should very much dislike to see anyone throw out the Graham Test because it is in error occasionally or because he thought it in error occasionally. It seems to me that if we depended upon almost any laboratory test alone for diagnosis, we would be in error a great many times and I don't think there is any particular reason for depending absolutely and entirely upon the Graham Test.

In a good many clinics, chronic cholecystitis, so-called, makes up 50% of the gall-bladder cases. If we operated upon such a percentage of chronic cholecystitis cases, we should have to depend upon the Graham Test alone, regardless of symptoms, and most of us, knowing what we do about gall-bladder surgery, would keep away from such clinics.

We need to look over this subject of chronic cholecystitis pretty carefully. We have heard a great deal about the strawberry gall-bladder or cholesterol gall-bladder. It is represented by *no* group of symptoms, and is only diagnosticated at operation. We are told it is a serious disease and may be the cause of gall stones, but few surgeons would be willing to submit to operation if they thought they had a cholesterol gall-bladder, which might possibly cause a stone to be formed. Surgeons are a good deal like Little Jack Horner, who "put in his thumb and pulled out a plum." The gall-bladder is a nice plum to take out, but the question is, was it the cause of the symptoms of which the patient complained?

Dr. John Homans, Boston, Mass.: I am afraid, Mr. President, that I can't give you much of a report. I think at the Peter Bent Brigham Hospital the x-ray department feels that their examinations have been quite accurate and I, personally, have found it difficult to find fault with that attitude. I have always felt, as Dr. Young brought out, that the Graham Test might show a perfectly normal gall-bladder in the presence of the grapeseed stones, which often cause so much disturbance; so that when the symptoms of gall-stone colic were present and the x-ray and the cholecystogram said the gall-bladder was normal, I have felt that it might very well be pathological. At the same time, whenever I have attempted to set up my opinion against the findings of the cholecystogram, so far I have not been right. I have a very high respect for the accuracy of the test.

I agree with Dr. Jones that it is a great pity to say that disease is present in the gall-bladder in the cases with very mild symptoms, merely because the cholecystogram suggests that there may be something the matter. I feel almost more strongly, I think, than he does about it.

I am sorry I can't give you a more accurate report from the Peter Bent Brigham Hospital. I can only pass along to you the impression that our diagnosis by cholecystogram has been extremely satisfactory.

Dr. Fred B. Lund, Boston, Mass.: A great many people have the idea that they have to have a physical examination every so often and they go to a doctor, people with nervous prosperity and nothing to think about except their symptoms; among other things they have a Graham test. They are never seen by a surgeon. One such woman who lived in the city of Washington came to see me a short time ago. She had a positive Graham test and yet at the clinic where she went they said an operation wasn't necessary at once, but as soon as she could conveniently arrange it, she must have it out, and she came to me eager to be operated upon. I naturally had some more x-ray plates and Graham tests made, at a very good hospital and received a positive report of the Graham test. I looked at the x-rays and saw the gall-bladder was filled with the dye and the reason that the report was positive was that the diagnosis was made in Washington on a slight irregularity of the gall-bladder, so I got them made again and it was examined by another roentgenologist who reported that the Graham test was all right. It seemed to me that it was all right so that lady has her gall-bladder still.

I don't entirely agree with what Dr. Jones said about taking out a cholesterol gall-bladder. I think it is very wrong to take out a pale blue normal-looking gall-bladder because you have made a diagnosis of cholecystitis. If it is thick, or white, or has fresh adhesions or old adhesions, I don't see how you will get out of taking it out and if it is thickened, I think it has a granular lining, and I think I can tell the difference between granular lining and the normal gall-bladder tissue.

I think you want to be careful about taking out the normal gall-bladder because it is common to my observation that people are operating on them on hurried diagnoses, and if they find the gall-bladder normal, they will take it out simply because they have told the patient she has it, and that comes pretty close to malpractice, in my opinion. Unless we are careful and efficient about interpreting these things and act more on the symptoms than on the test, as has been brought out by these figures, and don't

operate where we find a normal gall-bladder, we are doing something very wrong.

Dr. Horace P. Stevens, Boston, Mass.: It seems to me that one of the sources of dissatisfaction with the Graham test depends on the point that Dr. Young brought out so strongly; that is that we are inclined to forget that the Graham test is a test of function and not a test of pathology of the gall-bladder, per se, and that if we think of the Graham test as right or wrong, according to whether we find pathology in the gall-bladder or not, we are opening up a chance of error that is unfair to the test.

Another point in regard to the Graham test is that I think we see sometimes a tendency to resort to it in cases that are clinically so evidently diseased gall-bladders that it is entirely unnecessary.

The Graham test is not without its untoward effects. We have all seen a good many cases of serious digestive upsets following the oral administration of the dye and I can recall at least two such cases that were so startling and dramatic that they caused experienced surgeons to resort to immediate operation for symptoms of acute intra-abdominal disease. I think we should hesitate to apply the Graham test in the cases where we don't need it, where the symptoms are sufficient for diagnosis without it.

Dr. David Cheever, Boston, Mass.: I should like to say one word. I think Dr. Young is doing a most useful work in analyzing and reporting these cases and we should have similar reports on other clinics which might further confirm or nullify his impressions because I feel that the Graham test is a much more lusty and promising infant than Dr. Young and Dr. Sowles apparently think it is.

Now, the negative test of the dye is given by the oral method which shows the gall-bladder which fills well, is of normal size and contour, shows no contrast shadows and empties well and may be considered a sufficient test of normality but if it is positive,—that is, where the gall-bladder fails to fill or shows any peculiarities, the intravenous method should always be used for confirmation. The particular statement which I think Dr. Young made (he will correct me if I misquote him) and which seems to me not quite true was to the effect that the intravenous method rarely changes the diagnosis from that tentatively established by the oral method. If that is his experience it certainly is not the experience at the Peter Bent Brigham Hospital.

We have found, I think, that the presumptive diagnosis as made by the oral method has been many times changed by the intravenous method and the latter has usually been proved to be correct at operation.

Dr. Lincoln Davis, Boston, Mass.: The discussion by Dr. Jones and Dr. Lund in regard to what is or what is not a chronic gall-bladder brings up a very practical and important question, which we are confronted with continually. When we explore a gall-bladder and it looks quite normal, whether the Graham Test has been positive or not, it is difficult to decide what to do. Shall we take it out, or because its walls are thin and it has a good color and the bile can be expressed from it, shall we conclude that it is normal and ought to be left alone?

I have had the experience of operating for supposed cholecystitis and finding a very normal looking gall-bladder with thin-walled blue coat. On aspiration normal looking bile was obtained. Further palpation of the empty gall-bladder was negative for stone. The gall-bladder was, nevertheless, removed after much misgiving. Upon opening it two little grapeseed stones were found, that I had missed and my assistant had missed. I think it is often very difficult to tell whether the gall-bladder is normal or not until after it has been removed and opened.

Since that experience I have felt it was not altogether malpractice to remove these gall-bladders that appear quite normal on the outside, in the presence of definite gall-bladder symptoms.

Dr. Lyman Allen, Burlington, Vt.: I think Dr. Young said a whole lot when he said it is a "test of function and not a test of organic disease." That is the point. Some of us who have had cholecystitis know that clinically the patient is probably aware of whether his gall-bladder is functioning fairly well or not; in other words, we do not always need a Graham test to tell us that our gall-bladder is not functioning correctly and, secondly, the people with cholecystitis have long periods of time when they consider themselves well, weeks, months, years.

The Graham test is a test of function and not a test of organic disease and, therefore, while I think it has a place in diagnostic procedure I do think we have clinical symptoms which tell us usually whether our gall-bladders are functioning or not, and the Graham test does not tell us whether the gall-bladder is diseased or contains stones. That is my feeling about the Graham test.

Dr. Philemon E. Truesdale, Fall River, Mass.: As long as we are human, we are likely to be biased in some degree. An example of this is furnished by Dr. Jones' report of the inclination of one author to justify the removal of the gall-bladder on very slight variation in the shadow on the film.

When the cholecystogram conflicts with the clinical history, I believe the latter to be a more dependable guide.

The internist is naturally more likely to wait until there is no shadow whatsoever before he is sure that the patient should be operated upon and the surgeon sometimes is inclined in the opposite direction. Somewhere between these two in the vast majority of cases it should not be difficult to determine where medical treatment should stop and surgery begin.

DR. E. L. YOUNG, JR.: There are one or two things I should like to emphasize. First, what I believe is important, is that the clinical evidence is the most essential part in the diagnosis of obscure gall-bladder conditions. A great many people know there is a Graham test or x-ray that shows a gall-bladder, and what is the answer? They ask you for it and if you don't give it and act on it, somebody else will.

I said two years ago and I still feel that we shall have to educate people to the knowledge that time may be the only way in which the accurate diagnosis may be made in some cases.

The second thing is the need of repeated Graham tests in doubtful cases. That leads to the answer of Dr. Cheever's statement as to which is most accurate if repeated tests are done and the gall-bladder does not fill. It seems to me that the positive is more accurate than the negative test, because of the fact that a slightly diseased gall-bladder may show a normal test. We do not operate unless we are sure there is a justification for operation, and if we believe that, and sufficient time has elapsed and sufficient study has been made of the patient so that not only do we feel that the gall-bladder is affected, but there is no other lesion present, I have not seen occasion to change my statement of two years ago that regardless of what the gall-bladder feels like, if no other disease can be found, it should be removed.

A CLAIMANT OF THE DISCOVERY OF THE PSITTACOSIS GERM

Dr. Lloyd Arnold, bacteriologist of the University of Illinois, claims to have discovered the bacillus of "parrot fever".

This alleged discovery followed the autopsy on a parrot and the bacillus was found in the intestinal tract with the explanation that the disease is akin to dysentery found in calves and sheep and other inhabitants of barn yards.

Although the records of this disease show that it was recognized in 1879 by Ritter in Germany, it is much in evidence now because of the attention concentrated on it by public health officials. The likelihood of any extensive epidemic is not feared by those in position to form an opinion on the subject.

If this alleged discovery is not regarded as sound by authorities, we shall probably have new claimants from time to time. In previous cases claims have been made for the isolation of the germ.

THREE APPOINTMENTS OF LECTURERS IN THE HARVARD MEDICAL SCHOOL

The *Boston Transcript* reports that Dr. Lafayette B. Mendel, Sterling Professor of Physiological Chemistry at Yale, and Dr. William M. Clark of Johns Hopkins Medical School have been appointed Cutter lecturers on preventive medicine for 1930.

Dr. Franz Knoop, Professor of Biological Chemistry at Tubingen, Germany, has been named Dunham lecturer for 1930-31.

A CLAIM FOR ANOTHER POSSIBLE REMEDY FOR CANCER

According to notices which have appeared in the newspapers with considerable emphasis Doctors W. B. Coffey and John B. Humber of the Southern Pacific Hospital, California, claim to have secured favorable results in the treatment of cancer by the injection of a serum made from the outer layer of the adrenal glands of sheep.

We share the skepticism of the profession at large with respect to alleged discoveries of startling importance in the treatment of disease because of the multitude of false claims in the past.

If scientists could be made to refrain from publicity in advance of thoroughly established facts with respect to cures of disease the dignity of the profession would be enhanced and victims of disease would not have to suffer the heart-rending experience of shattered hopes.

We share the common belief that great advances in the treatment of cancer are coming and will be greatly pleased if this last claim is proven to be correct but the reports thus far lack adequate confirmation.

MONKEYS AND THEIR DISEASES IN RELATION TO MAN

The U. S. Public Health Service has issued as Hygienic Laboratory Bulletin 152, a very technical publication on the classification of monkeys and of their diseases in relation to the diseases of man. This bulletin was prepared by Professor C. W. Stiles of the U. S. Public Health Service and Dr. Albert Hassall of the U. S. Bureau of Animal Industry. Monkeys have many diseases that occur in man and on this account they are more and more becoming objects of scientific study in public health laboratories, but public health investigators have heretofore lacked a convenient classification which would assist authors in the identification of these mammals and their diseases, such as is presented in this bulletin.

With the increasing knowledge of the diseases which can develop in monkeys, questions of public health importance arise in regard to the potential rôle of the menagerie, the circus and the zoo in spreading diseases to man. Hygienic Laboratory Bulletin 152 gives the desired information in regard to the apes, monkeys and lemurs, for under each animal cited there is a list of its parasitic diseases, and in the introduction under the name of each parasite there is a list of all the apes, monkeys and lemurs for which each particular parasite has been reported and a notation whether the parasite is transmissible to man.

It is interesting to note that two of the hookworms reported for man are reported for apes also, and that two infections ("tongue worms") which man contracts from snakes are very widespread among the apes and monkeys.

This publication will be of interest chiefly to anatomists, bacteriologists and zoologists and can be obtained by applying to the Surgeon General, U. S. Public Health Service, Washington, D. C.—*United States Public Health Service.*

THE ECONOMIC VALUE OF COD LIVER OIL AND MILK AS DIETARY SUPPLEMENTS FOR UNDERWEIGHT ADULTS

BY ARTHUR D. HOLMES, PH.D.,* MADELEINE G. PIGOTT, B.S.,* WM. ALFRED SAWYER, M.D.,* AND LAURA COMSTOCK, M.S.*

UNDERWEIGHT in infants and young children is a subject of continual discussion. On the other hand, underweight in adults receives much less attention, perhaps due to the assumption that after childhood the question of body weight is of concern only to the individual in question. Nevertheless, there seems to be a somewhat general assumption that underweight adults are often undernourished and sometimes both undernourished and malnourished. However, even though it seems to be very generally recognized that undernourished or malnourished persons are more susceptible to infections and diseases which follow in the wake of infection, relatively little attention has been given to the economic importance of continued underweight in adults.

A complete study of the various factors responsible for underweight in young adults would be too extensive for consideration in this paper. Accordingly, the study reported here was inaugurated to determine the extent to which an inadequate supply of the fat-soluble vitamins may contribute to underweight. Attention has been given to the possibility of reducing colds, to increasing body weight, and to improving efficiency by supplementing the average dietary with cod liver oil and milk, which are recognized as excellent sources of fat soluble vitamins.

"Colds" constitute an economic factor of material significance. They contribute very materially to the amount of time lost by those employed and this often means a curtailment of income. Frequently "slight colds" do not cause the one afflicted to remain away from his work, but they usually result in lowered efficiency, serve to spread the infection, and provide the opportunity for the development of many of the serious conditions which occur as an aftermath of colds. Accordingly, any possibility of diminishing colds is of sufficient economic importance to merit serious consideration.

An individual's efficiency is said to be dependent upon his state of nutrition. A well-nourished person is assumed to be more efficient than an undernourished or malnourished person. Accordingly, in this test of the possibility of increasing the body weight of underweight adults by supplementary feeding of cod liver oil and milk, a study was made to determine the efficiency of the subjects when they were employed at specified tasks. The efficiency of those under observation was graded by means of the Bedeaux rating.

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A medical examination previous to the investigation served to reveal any abnormal physical conditions accompanying underweight. A record was made concerning any change in the abnormal conditions during the period of the test. Thus it was possible to correlate any change in the abnormal conditions with any change in susceptibility to colds or with any change in body weight.

PROGRAM OF INVESTIGATION

Young women were selected to serve as subjects for this investigation. At the beginning of the test all of the women were six per cent. or more underweight. They were divided into two groups which appeared to be as nearly identical as possible. One group of 26 served as the experimental group and the second group of 23 served as controls. The experimental group was given one-half pint of milk daily at the time of the morning and afternoon rest periods, and a scant dessert-spoonful of cod liver oil six mornings and five afternoons per week.

Each Wednesday morning the girls were weighed. A record was made of the body weight, of the attendance during the previous week, of the girl's efficiency at her usual tasks, of the absences on account of illness, and of the actual number of servings of cod liver oil compared with the number of possible servings. These data, and a statement concerning the individual's estimate of the value of cod liver oil and milk to her, were compiled in individual charts. The ideal weight for the type of individual was also reported on the chart. In the upper right corner of the chart was recorded the subject's number, age and whether married or single. Chart No. 1 is typical of the charts compiled for the different members of the experimental and control groups.

THE EXPERIMENTAL PERIOD

The period of the test was from December 1 to May 15. This season was selected because it is the season when colds are most prevalent. Incidentally, this is also the period of minimum amount and poorest quality of sunshine.

THE COD LIVER OIL

The cod liver oil used in this investigation was produced from fresh livers by the direct steam process at plants located along the Massachusetts shore.

The chemical and physical characteristics of this oil were determined by the methods outlined in the United States Pharmacopoeia[1], and the results obtained are for specific gravity 0.923; for refractive index 1.4788; for saponification value 184.08; for iodine number 168.73; for free fatty acid 0.63 per cent.; and for unsaponifiable ma-

terial 1.31 per cent. These values are in accord with the U. S. P. X. specifications which are specific gravity 0.918-0.927; saponification value 180.0-190.0; iodine number 140.0-180.0; free fatty acid not to exceed 1.4 per cent. and unsaponifiable material not to exceed 1.5 per cent.

The vitamin A content of the oil was determined in accordance with methods outlined in U. S. P. X.[2] and was found to be in excess of 1250 vitamin A units per gram.

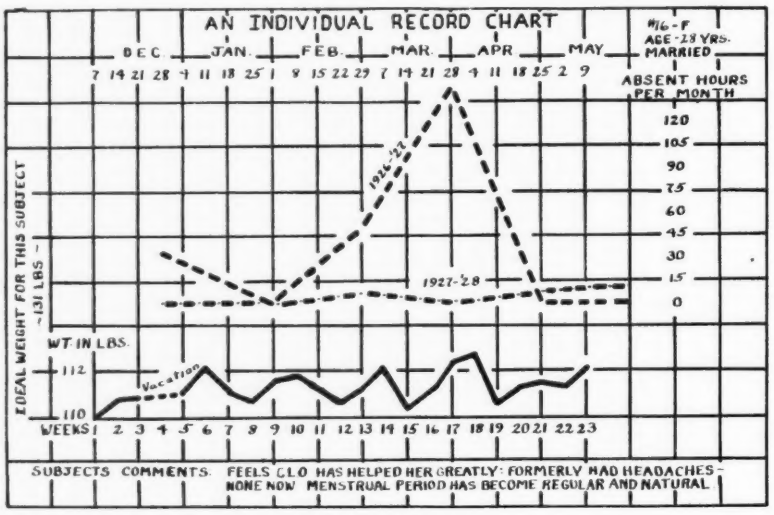

CHART NO. 1

ABSENCES DUE TO ILLNESS

The complete reports in connection with the absences of all the girls are too voluminous to be reproduced here. Accordingly, the absences have been considered on an "average" basis. The average number of hours absent per person per month has been computed for the two groups. These monthly average absences are reported as curves in Chart No. 2. On referring to the chart it will be noted that the number of absences during December was more than twice as large for the control group as for the experimental group, being seven hours and three hours respectively. Also it is of interest to note that for both the experimental and the control groups the greatest number of absences due to illness occurred during the month of February. The number of absences for the control group increased from March through April and May, whereas the number of absences per month for the experimental group decreased from March through April and May. Considering the entire experimental period the number of absences per person per month was for the experimental group 4.1 hours and for the control group 6.3 hours. Thus the absences of the experimental group averaged 2.2 hours per person per month less than those of the control group.

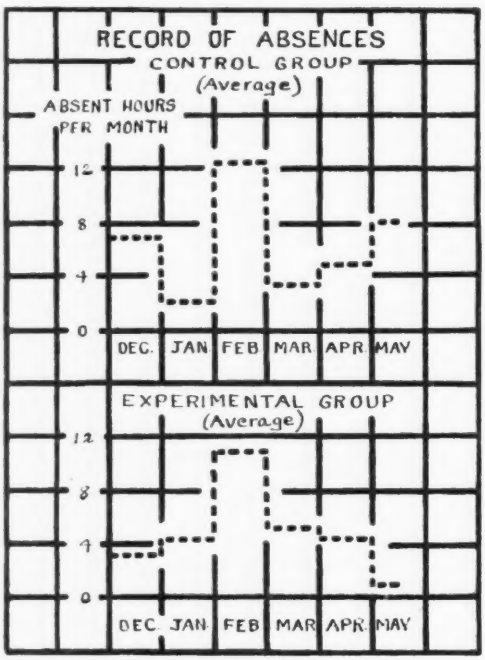

CHART NO. 2

BODY WEIGHT RECORDS

While it is not possible to report here the complete data for the weekly body weights of all those who assisted as subjects of this investigation, it nevertheless seems desirable to include some detailed information concerning the body weight of each individual of the two groups. The tables which follow supply data relative to the age, ideal weight, initial weight, the per cent. underweight at the beginning of the investigation, final weight, the per cent. underweight at the end of the investigation, and the per cent. increase or decrease in body weight.

The individual weights of the members of the experimental and control groups have been averaged for each week that the investigation was in progress. The averages thus obtained are reported as curves in Chart No. 3. Referring to

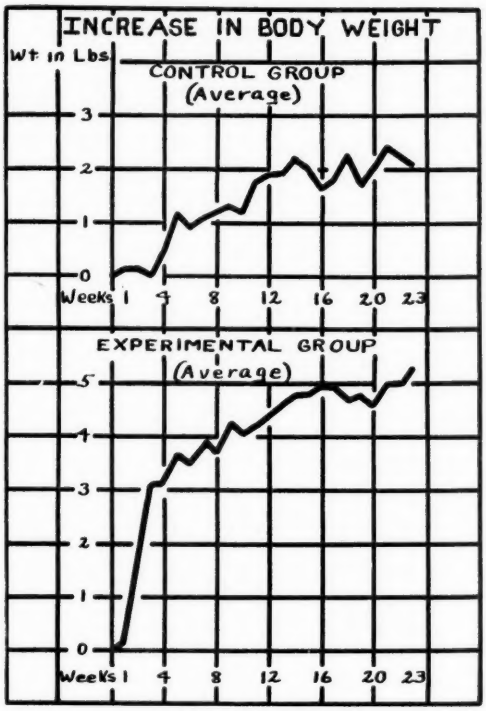

CHART NO. 3

the chart it will be noted that the average weight of the control group varied somewhat, week by week, but in general the group made a rather consistent gain throughout the period of the experiment. The curve for the control group indicates an average gain of slightly over two pounds during the twenty-four week test. The average weight of the members of the experimental group showed a much more rapid increase during the first month of the experiment than was the case for the control group. After the first month, however, the increase in average weight of this group was very similar to that of the control group. The total gain in weight for the average person of the experimental group for the entire period was slightly over five pounds. Accordingly, the experimental group gained about three pounds more during the experimental period than the control group.

INCREASE IN BODY WEIGHT

CONTROL GROUP

Age in 1927	Ideal Wt.	Initial Wt.	% Under Wt.	Final Wt.	% Under Wt.	% Increase or Decrease
Yrs.	Lbs.	Lbs.		Lbs.		
			Group I			
			(20 years old or under)			
20	119.0	102.5	14.0	99.7	16.0	—2.6
20	140.0	114.0	18.0	114.5	18.0	0.5
19	124.0	101.5	18.0	100.5	18.9	—1.0
			Group II			
			(Between 20 and 30 years of age)			
22	128.0	120.5	5.8	119.7	6.4	—0.5
29	120.0	98.5	18.0	100.5	16.0	2.1
22	138.0	129.0	6.5	132.5	4.0	2.6
25	129.0	110.0	15.0	111.0	13.9	0.9
21	118.0	103.2	12.0	105.2	10.5	2.2
24	144.0	122.2	15.0	125.0	13.0	2.2
24	117.0	101.7	13.0	103.0	11.9	1.1
25	139.0	121.0	13.0	123.0	11.5	1.7
25	122.0	106.0	13.0	107.0	12.0	1.0
22	140.0	120.0	14.0	121.7	13.0	1.6
26	126.0	113.5	9.9	106.5	15.0	—6.2
24	121.0	110.0	9.0	111.5	7.8	1.4
21	120.0	111.0	7.5	105.0	12.5	—5.4
27	131.0	99.5	24.0	98.0	25.0	—1.6
23	125.0	107.5	14.0	110.7	11.0	3.1
21	129.0	108.5	16.0	110.5	14.0	1.8
22	117.0	103.0	11.0	99.5	14.9	—3.4
22	117.0	97.0	17.0	101.0	13.6	4.2
24	124.0	115.0	7.0	118.2	4.0	2.9
			Group III			
			(30 years old or over)			
33	135.0	129.5	4.0	132.0	2.0	2.0
					Average	0.5

INCREASE IN BODY WEIGHT

EXPERIMENTAL GROUP

Age in 1927	Ideal Wt.	Initial Wt.	% Under Wt.	Final Wt.	% Under Wt.	% Increase or Decrease
Yrs.	Lbs.	Lbs.		Lbs.		
			Group I			
			(20 years old or under)			
20	123.0	106.0	13.8	111.0	9.7	4.8
18	123.0	113.0	8.0	115.0	6.5	1.8
19	135.0	103.5	23.3	104.7	23.1	1.3
			Group II			
			(Between 20 and 30 years of age)			
24	129.0	109.7	15.0	111.0	13.9	1.0
28	126.0	111.2	11.7	119.7	4.9	7.8
24	134.0	108.0	19.0	111.5	16.7	3.3
25	141.0	128.0	9.0	123.7	12.0	—3.2
27	125.0	113.5	9.0	114.7	8.2	1.3
25	140.0	115.7	17.0	123.7	11.6	6.9
23	136.0	128.0	6.0	130.2	4.0	1.8
23	124.0	108.7	12.0	114.2	7.8	5.0
24	125.0	104.7	16.0	113.5	9.0	8.3
24	127.0	113.0	11.0	114.2	10.0	1.2
28	131.0	110.0	14.0	112.0	12.5	1.8
21	126.0	104.2	16.8	108.7	13.6	4.4
25	148.0	135.0	8.8	134.2	9.2	—0.4
24	135.0	117.0	13.0	120.7	10.5	3.3
21	141.0	126.2	10.4	126.2	10.4	0.0
25	126.0	105.5	18.0	109.5	13.0	3.8
23	133.0	119.0	10.5	114.2	14.0	3.9
			Group III			
			(30 years old or over)			
30	135.0	118.0	12.6	128.0	5.0	8.5
32	138.0	118.2	14.0	123.7	10.0	4.7
39	120.0	91.0	24.0	96.0	20.0	5.5
32	131.0	112.5	14.0	113.2	13.5	0.7
37	130.0	91.7	29.4	96.2	25.9	4.8
			Overweight			
28	129.0	150.0	16.0	158.7	23.0	6.0
					Average	3.2

EFFICIENCY STUDY

The economic value of the efforts of individuals depends upon the results produced. Thus, in order to compare the efficiency of various individuals, it is obviously necessary to grade or rate the efficiency of different individuals. In this instance it has been of interest to compare the efficiency of the underweight women who served as subjects in the experimental and control groups. The Bedeaux rating has been employed

for this purpose. The weekly ratings were averaged and are reported as monthly ratings. Those classed as non-productive, "N.P.," are persons whose work was not quantity production, but who acted as checkers, inspectors, and the like. The results of the ratings appear below:

BEDEAUX RATING

CONTROL GROUP

No.	December	January	February	March	April	May	Average
1	89.0	85.0	80.2	75.8	83.5	78.0	81.9
2	N.P.	N.P.	N.P.	N.P.	N.P.	N.P.	N.P.
3	98.0	98.0	97.0	92.5	89.5	85.0	93.3
4	74.0	73.5	79.2	67.4	74.5	66.0	72.4
5	68.3	63.7	87.0	72.0	77.2	A	61.4
6	73.4	79.7	83.7	81.6	80.5	78.0	79.5
7	74.6	72.2	70.0	61.8	75.0	68.0	70.3
8	N.P.	N.P.	N.P.	N.P.	N.P.	N.P.	N.P.
9	82.0	69.7	75.0	76.0	79.7	80.0	77.1
10	N.P.	N.P.	N.P.	N.P.	N.P.	N.P.	N.P.
11	88.0	79.7	74.7	74.0	75.0	73.0	77.4
12	81.2	83.5	80.0	83.4	83.4	94.0	84.3
13	83.2	82.5	77.0	76.4	85.7	80.0	80.8
14	80.8	77.0	77.5	83.0	84.2	75.0	79.6
15	81.2	78.7	81.7	87.4	92.2	99.0	86.7
16	78.2	78.7	79.0	79.0	74.0	79.0	77.9
17	79.7	80.2	89.0	81.6	88.5	89.0	84.7
18	71.4	78.5	77.7	76.2	79.0	76.0	76.5
19	64.4	68.7	78.0	76.2	80.5	86.0	75.6
20	N.P.	N.P.	N.P.	N.P.	N.P.	N.P.	N.P.
21	81.4	78.7	68.2	73.8	82.5	79.0	77.3
22	79.4	78.0	68.7	62.0	55.6	60.0	67.3
23	65.0	68.2	74.5	82.6	74.7	79.0	74.0
Average	78.6	77.6	78.8	76.9	79.7	74.4	77.7

BEDEAUX RATING

EXPERIMENTAL GROUP

No.	December	January	February	March	April	May	Average
1	N.P.	N.P.	N.P.	N.P.	N.P.	N.P.	N.P.
2	74.6	77.7	79.2	75.6	83.7	79.5	78.4
3	50.2	51.0	N.P.	N.P.	N.P.	N.P.	
4	85.4	87.5	84.5	84.2	85.7	86.0	85.6
5	80.6	79.7	83.5	76.5	80.5	76.5	79.6
6	N.P.	N.P.	N.P.	N.P.	N.P.	N.P.	N.P.
7	N.P.	N.P.	N.P.	N.P.	N.P.	N.P.	N.P.
8	85.0	78.0	72.0	74.2	79.0	75.5	77.3
9	N.P.	N.P.	N.P.	N.P.	N.P.	N.P.	N.P.
10	84.2	84.0	86.2	95.0	90.7	92.5	88.8
11	N.P.	N.P.	N.P.	N.P.	N.P.	N.P.	N.P.
12	63.0	56.2	62.3	85.2	81.5	63.0	68.5
13	77.4	82.5	82.2	84.6	93.2	92.0	85.3
14	73.4	67.7	64.7	75.8	78.7	84.0	74.1
15	N.P.	N.P.	N.P.	N.P.	N.P.	N.P.	N.P.
16	81.8	78.2	85.2	83.6	84.2	83.5	82.7
17	78.6	79.7	81.5	83.6	84.0	84.5	81.7
18	84.2	87.0	85.2	84.2	90.0	85.0	85.9
20	84.4	76.2	76.5	81.6	81.5	85.0	80.9
21	79.8	82.2	81.0	82.6	80.2	91.0	82.8
22	91.6	84.2	81.7	74.4	73.2	66.0	78.5
23	78.0	77.7	76.7	80.6	88.0	84.0	80.8
24	91.6	75.0	83.0	87.8	89.2	92.5	86.5
25	81.2	77.7	79.5	76.6	86.2	83.5	80.8
26	N.P.	N.P.	N.P.	N.P.	N.P.	N.P.	N.P.
27	N.P.	N.P.	N.P.	N.P.	N.P.	N.P.	N.P.
Average	79.1	76.8	79.1	81.6	84.1	82.6	80.5

On referring to the above tables it will be noted that four of the women in the control group and nine in the experimental group were graded as "non-productive." Excluding those rated as "non-productive," the members of the control group showed a rating (average) of from 61.4 to 93.3 with an average of 77.7 for the group. Similarly the members of the experimental group rated (average) from 68.5 to 88.8 with an average of 80.5 for the group. Considered on the basis of the entire experimental period, the efficiency of the two groups was 77.7 for the control group and 80.5 for the experimental group. It is interesting to note that efficiency rating for the two groups averaged exactly the same for the first three months. During the last three months the experimental group showed a superior rating of 4.7 for March, 4.4 for April, and 8.2 for May.

MENSTRUAL IRREGULARITIES

In preparing the histories of the young women who were to assist as subjects for this investigation, it developed that four of the women assigned to the experimental group suffered from more or less abnormal menstrual conditions. At the time of the initial weighing these women were from eleven to fifteen per cent. underweight. Three of them complained of long and debilitating menstrual periods. Another stated that she was troubled with irregular and unnatural menstrual periods.

The literature contains a number of references to a possible relation between an inadequate ingestion of vitamin A and abnormal functioning of the reproductive organs.

Wolbach and Howe[3], from their studies of changes in epithelial tissues due to a lack of vitamin A, conclude that the replacement of uterine epithelium by keratinizing epithelium can account for sterility in the female.

Macy[4] and coworkers report that the presence of cornified cells in the epithelial layers of the vagina is the first and most delicate symptom of vitamin A exhaustion.

Read and Palmer[5] are of the opinion that vitamin A has a marked influence on the ability to reproduce and successfully nurse young.

Sure[6] believes that vitamin A deficiency will cause sterility of the same type as that produced by a deficiency of vitamin E (resorption of the fetus) even though the diet contains an abundance of vitamine E.

Hughes, Aubel and Lienhardt[7] have studied the effect of a vitamin A deficient diet on reproduction in swine. They say "no living pigs were farrowed by sows on the vitamin A deficient diet.—The whole mechanism controlling birth was entirely upset seemingly by the lack of vitamin A in the diet.—It seems only reasonable to conclude that the death of the fetuses in the uterus was due to lack of vitamin A in the feed of the mothers."

Holmes, Doolittle and Moore[8] found that the addition of cod liver oil to the ration of breeding hens increased egg production, increased hatch-

ability of eggs, and that the chicks produced by the experimental birds showed higher viability than those from the controls.

Poulsson[9] reports results of administering cod liver oil to a woman subject to interrupted pregnancies. Two normal children born at term resulted from seven pregnancies. During the eighth and ninth pregnancies cod liver oil was administered from the fourth month. A normal living child resulted in each instance.

McClendon, Burr and Wildebush[10] "found that the basal metabolism of half the women students examined was low and was about 15 per cent. below Aub-Dubois standard.—It is a significant fact that all the cases of amenorrhea fell in the low basal group."

Macomber[11], as a result of his investigations and clinical observations, concludes that "Fat Soluble A is necessary for growth and this is just as true for intra-uterine growth as it is for the newborn animal. There is now ample evidence to show that stillbirths or absorption of the fetus will occur on diets which are deficient in this regard. Nursing young whose mothers are kept on fat soluble A free diets soon cease to grow and if the diet is continued, die. The oestrous cycle also can be made to occur less frequently or cease altogether."

In view of these reports of the possible relation between vitamin A deficiency and disturbed reproduction functions, it was of interest to note whether increasing the vitamin content of their dietary influenced the abnormal menstrual condition of the women referred to above. During the progress of the test an improvement was noted in the menstrual irregularities of all four women. Three of the women reported that their menstrual periods had been shortened and the fourth stated that the periods had become regular and natural. It may also be noted here that their combined absences during the period of the test were only about one-seventh their absences for the same period the previous year. Obviously it is impossible, from this meager data, to draw any general deductions concerning the extent that enhancing the vitamin content of the diet may have influenced the improvement of the menstrual condition. Quite likely other factors also contributed to the result. Nevertheless the results reported here, considered in conjunction with the results reported in the literature cited, seem to indicate that vitamin A deficiency is a contributory cause of irregularity of menstrual and possibly other functions of the human reproductive organs.

DISCUSSION

The investigation reported here was made to determine whether cod liver oil and milk, as supplements to the diet of underweight adults, were of value for decreasing "colds," increasing body weight, improving efficiency, and correcting abnormal physical conditions.

Forty-nine young women, six per cent. or more underweight, served as subjects of the investigation. They were divided into an experimental group of twenty-six which received cod liver oil and milk as supplements to their diet and a group of twenty-three which served as controls.

A cod liver oil of known history and of high vitamin A content was used. The experimental period was of twenty-four weeks' duration, December 1 to May 15, the season when colds and sickness are most prevalent.

The experimental group had fewer colds than the control group and was absent from employment less hours per person per month.

Body weight records were made weekly throughout the entire period for each subject. Both the experimental and control groups increased in body weight during the test. The average gain in weight was five pounds for the experimental group and three pounds for the control group.

The efficiency of the two groups was compared. For the first three months of the experiment, the efficiency of the two groups averaged exactly the same. During March, April, and May, the efficiency of the experimental group was materially higher than that of the control group.

Four young women in the experimental group reported menstrual irregularities. All these women improved during the course of the experiment.

At the termination of the experiment, each girl of the experimental group gave a brief statement concerning her personal conclusions regarding the test. Nearly all of the women reported that the use of cod liver oil and milk as supplements to their diet had improved their physical condition.

The results of this preliminary study do not indicate that any phenomenal change resulted from the ingestion of cod liver oil and milk by underweight young women. On the other hand, it was found that coincident with the ingestion of these dietary supplements, the experimental group was absent less hours per person per month, increased more in body weight, and showed a higher efficiency than the control group. Accordingly, on the basis of these results one would conclude that cod liver oil and milk used as dietary supplements for underweight adults have appreciable economic value.

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AN UNUSUAL CASE OF PELVIC ABSCESS

BY CARMI R. ALDEN, M.D.*

PELVIC abscesses are comparatively common end results of infections of the female genital tract. The staphylococcus, streptococcus, colon bacillus and gonococcus, either singly or as a mixed infection, may be the causative organisms. Infections in the puerperal state, especially following abortions, and gonorrheal salpingitis are the conditions most frequently resulting in a pelvic abscess.

The starting point may be the endometrium, myometrium, parametrium or fallopian tubes. The tubes, ovaries, broad ligaments and uterus are then surrounded with exudate, which is poured out to localize the spreading infection. This exudate, hard at first, gradually softens and is absorbed. If the softening takes place much faster than the absorption, an abscess is formed, which points in one of three places; the cul-de-sac of Douglas, the rectum, or the groin. This is brought about by two factors: (1) gravity; due to the constant elevation of the patient's head; (2) their position as the nearest points of egress.

The case which I am going to report is unusual in that the abscess pointed in the region of the left costovertebral angle, against all the laws of gravitation. A thorough search of the literature fails to show a similar reported case, excluding tubercular psoas abscesses.

B. C. H. CASE No. 565572.

Mrs. L. M., aged 23, a multipara, entered the Boston City Hospital in active labor nine days before her expected time. She had had no prenatal care. Her three previous deliveries had been normal and there had been no complications in the convalescences. She had had no serious iliness and no operations, but had had a three months' miscarriage a year previous.

On physical examination the findings were normal: the blood pressure 100/65; the urine and a Wassermann test of the blood were negative. After a four hour labor with the vertex presenting in an R.O.A. position, she delivered a living male child normally. There was no tear and no sutures were placed. The placenta and membranes were complete.

The baby was treated from the day after birth until the eighth day for bilateral discharging eyes, although three smears were negative. The patient's temperature remained normal until the eighth day, when she had a chill and it rose to 101. The fundus seemed a little high, so she was given ergot and an ice bag to the fundus. On the 10th day her temperature was 104, pulse 140, and she continued to run a septic course for the next three months.

20th day. There was a profuse discharge; the uterus was in the axis of the vagina and there were bilateral tubo-ovarian masses the size of lemons. She was receiving hot douches and depletion with tampons and had had several injections of aolan.

50th day. The temperature was ranging from 102-103 and the pulse from 120-130. There was considerable pain in both legs; the uterus was in the axis of the vagina and pushed over to the right by a large tender mass rising three fingers above the symphysis.

75th day. The large mass had disappeared and there were only small masses in both vaults. Temperature 101, pulse 120. The white blood count was 14,000.

80th day. The patient complained of severe pain in the left leg and there was great difficulty in motion of the left hip. The hip and knee were flexed and the leg could not be straightened.

90th day. The patient had been up on eighteen inch blocks constantly and the temperature had come down to 100 in the evening. Examination showed the uterus in the axis of the vagina, both vaults tender but *no masses or exudate* could be felt. Because the left leg could not be straightened and as she showed the improvement indicated by the above findings, the patient was allowed to get up in a chair and to try to stand in order to help straighten the leg out. Many patients bedridden for this length of time, especially with abdominal pain, get these contractures from holding the legs flexed constantly and it often becomes a serious matter to get the legs straightened out and usable again.

103rd day. A slight swelling, not tender, was noted high in the left flank. Temperature ranging around 99.

107th day. At this time there was a definite pointing of a mass in the region of the left costovertebral angle. There was just a suggestion of redness and slight tenderness. Operation was decided upon.

Operation: Under gas oxygen anesthesia an incision was made in the left flank down to the left kidney, which was explored and found to be normal. The fingers were then pointed downward and immediately broke into an abscess cavity which evacuated about ten ounces of pus. In exploring the cavity it was found that a tract could be followed retro-peritoneally down to the base of the left broad ligament. The cavity was packed with gauze and the incision closed. A culture taken at this time later resulted in a bacteriological diagnosis of Streptococcus hemolyticus.

After Care: The pack was removed in forty-eight hours and the cavity was irrigated daily with Dakin's solution. The leg symptoms gradually abated until four weeks later the sinus had filled to the surface and the patient could walk about easily. She was then discharged to the Convalescent Home. There had been no pelvic symptoms nor any tenderness or masses found at several pelvic examinations made subsequent to operation.

COMMENT

Why this abscess dissected upward against gravity and continued to do so even with the patient up in a chair I am unable to say.

The leg symptoms fit perfectly with the ultimate outcome of the case due to psoas irritation, although, as before noted, they often occur in the absence of a psoas abscess in a condition which keeps a patient bedridden for months with the legs flexed.

The fact that this large pelvic abscess disappeared gradually under our fingers as though by absorption and then reappeared in its new site makes the case most interesting.

This patient was undoubtedly harboring a streptococcus which was perfectly harmless to her until the culture medium and her state of resistance were favorable for its growth. True puerperal sepsis introduced at the time of delivery always manifests itself by the third day. In this case there was no temperature until the eighth day.

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MEDICAL PROGRESS

PROGRESS IN DERMATOLOGY

BY HARVEY P. TOWLE, M.D.,* AND JACOB L. GRUND, M.D.*

GOLD THERAPY

THE outstanding feature of the twelve months which have elapsed since the writing of the last report is the testing of the efficacy of the gold salts in the treatment of lupus erythematosus. All over the country the members of the various dermatological societies have been reporting their experiences before their respective organizations. A few formal papers have appeared in the current literature but, as a rule, the student of this therapeusis must obtain his data from the reports of the society meetings.

We have reviewed, with considerable care, the reports of the meetings of the various dermatological societies of this country as published in the *Archives of Dermatology and Syphilology* during the past twelve months (Vols. 18, 19, 20). We give a brief summary below. The fact that reference is made to some meetings whose dates lie without our one-year period means only that it was some months before the reports were published.

Drs. Cummer and La Rocca before the Cleveland Dermatological Society, April 5, 1928, presented the case of a boy, aged 11, who had had his disease for 7 years. The distribution was over the scalp, nose, cheeks, chin, auricles, palms and forearms. The treatment was by two intravenous injections of gold sodium thiosulphate, 0.010 and 0.025 gms. respectively. The result: deep depression at first with subsequent improvement. The skin cleared.

April 10, 1928, Dr. Grindon presented a case to the St. Louis Dermatological Society. Female—43—Duration of disease—10 years. Location—bridge of nose. Treatment—gold sodium thiosulphate. Dosage—the initial dose was 0.05. Thereafter the dose was raised gradually to the maximum of 0.100 gms. Injections were repeated weekly. Result not reported.

April 20, 1928, Dr. Ormsby presented to the Chicago Dermatological Society a female—39—who had had the disease for three years. The localization was at first on the nose. Later the disease became generalized on the face, neck, chest and arms. The treatment was by injections of gold sodium thiosulphate, beginning in March, 1927. The initial dose was 0.002 gms. which was gradually increased to 0.100 gm. A total of 34 injections had been given. The result was a remarkable improvement.

Dr. Ormsby presented a second case of lupus erythematosus at the same meeting. This was of the discoid type. Since June 1927, 27 injections of gold sodium thiosulphate had been given in two series. After 11 injections the clinical signs had disappeared and treatment was omitted. Recurrence of the disease necessitated a resumption of the injections. The recurrent lesions have now disappeared leaving smooth scars behind.

At the same meeting Dr. Zeisler presented a male, 45, who had had lupus erythematosus for 4½ years. The eruption disappeared after 8 injections of gold sodium thiosulphate.

April 24, 1928, Dr. John Lane presented before the New York Dermatological Society a case in which the response to gold therapy was unfavorable. The patient was a female, aged 27. She had a lupus erythematosus of the discoid type, of eleven years' duration, on the bridge of the nose. In August, 1927, treatment was begun with gold sodium thiosulphate which was given weekly in gradually increasing doses. After the sixth injection the senses of smell and taste were impaired and both constitutional and local reactions appeared which forced a cessation of treatment. The eyes, mouth, lips, face, chest and feet showed local signs of reaction which slowly responded to injections of sodium thiosulphate. Later the gold therapy was resumed. Up to the time of presentation the patient had received 15 doses of sodium thiosulphate and 50 doses of gold sodium thiosulphate.

Dr. Highman, at the same meeting, exhibited a woman, aged 29, with lupus erythematosus of the discoid type which involved the nose and face. The duration of the disease was two years. From June 3 to July 15, 1927, she was given six weekly injections of gold sodium thiosulphate, beginning with a dose of 0.010 gm. and gradually increasing to 0.020 gm. The disease disappeared and to date, nine months later, has not reappeared.

Dr. Michelson showed before the Minnesota Dermatological Society, October 3, 1928, two cases, in a brother and sister, aged 27 and 18. The disease was on the cheeks. Eight injections of gold sodium thiosulphate produced a marked improvement.

Before the Cuba Dermatological Society, October 4, 1928, Dr. Quesada presented a woman, 33, who had the disease on the face for 3 years. Under gold therapy the disease had retrogressed.

October 3, 1928, Dr. McCafferty showed to the New York Academy of Medicine, the Section of Dermatology and Syphilology, a woman, aged 42, who showed an initial improvement but a later development of new foci even while under treatment.

November 13, 1928, Dr. Parounagian showed

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before the Manhattan Dermatological Society, a man, 38, who for seven years had had lupus erythematosus of the face, lips, and part of the scalp. He was given 15 injections of a gold compound with improvement in the local disease when he began to feel weak and to lose weight.

Dr. Pels showed before the Atlantic Dermatological Conference, Dec. 7, 1928, a man, aged 48, who presented lesions on the face, lips, scalp and buccal mucous membrane. He had received 16 injections of gold sodium thiosulphate within 3 months in doses varying from gm. 0.075 to 0.500. There was some reaction. The lupus erythematosus was improved.

In the discussion which followed Dr. Schamberg expressed a doubt as to whether the buccal lesions were really due to the disease agent. In his opinion they might well be due to the gold treatment.

January 16, 1929, Dr. Stillian presented to the Chicago Dermatological Society a woman, aged 29, who had had the disease for 11 years on the brow, nose, cheek, right ear and the scalp. She was given 8 successive doses of gold sodium thiosulphate at weekly intervals in doses ranging from gm. 0.050 to 0.100. The disease disappeared leaving behind a slight pigmentation. Six months later there was a slight recurrence which yielded to 3 doses of 0.050 gm. each. Since then there have been recurrences within the scar.

Dr. Sidlich reported the case of a girl before the Philadelphia Dermatological Society, February 1, 1929. The disease was of the acute disseminated type and had been present for five months. Gold therapy had caused improvement.

A male, 29 years old, was shown by Dr. Becket to the Dermatological Section of the New York Academy of Medicine, February 5, 1929, who had had a discoid form of several years. During the course of two and one half years he had received 100 injections of 0.100 gm. each. The disease had disappeared in part. That remaining was improved.

Dr. Grindon demonstrated a patient before the St. Louis Society, February 13, 1929, who had received gold sodium thiosulphate in weekly injections of 0.200 gms. with a resultant cure in 3 months. The disease had involved the nose and the eyelids.

Before the Chicago Society on February 23, 1929, Dr. Shaffer demonstrated a case of disseminated (subacute) lupus erythematosus in a female, aged 18. After 0.010 gm. gold sodium thiosulphate there had been a slight flare up and the treatment was at once discontinued.

Drs. Cole and Driver showed, before the Cleveland Dermatological Society, April 25, 1929, a girl, aged 12, whose disease involved the nose, cheeks, chin, forehead and ears. It had been present for five months. A single injection of gold sodium thiosulphate had produced great improvement.

In addition to these society reports there have been a few reports in the general literature.

H. E. Miller (*Cal. and Western Med.* 29: Oct. 1929) gives a report of 53 cases of lupus erythematosus treated by intravenous injections of gold and sodium thiosulphate.

Miller reports that 60% of the total cases were made clinically well. 30% were improved and 10% were not improved. Reactions were encountered in only three cases.

Alderson and Way (*Cal. and Western Med.* 28:6 (June)1928) report the case of a girl 15 who had a lupus erythematosus of 9 months' duration which involved the flush areas of the cheeks. She was given five gold and sodium thiosulphate injections intravenously at 5-day intervals. The respective doses were 0.05, 0.1, 0.15, 0.2, 0.25. After the fourth dose a transitory erythema appeared on the arms and neck. After the fifth dose, there were severe local and systemic reactions. The disease patches were aggravated, with a generalized erythema of the body. Fever 101° and angina were present. Then an intravenous injection of 0.50 gm. of sodium thiosulphate was given. A typical purpura appeared on the forearm from the site of the tourniquet to the wrist. Eventually the purpura disappeared and the lupus patches too cleared up leaving behind a little pigmentation.

Hudelo, Rabut and Guax (*Bull. Soc. fr. de dermat. et syph.* 36:122 (Feb.) 1929) report a death following the administration of a gold salt (chrysalbine) in a case of lupus erythematosus disseminatus.

The same authors report (Ibid.) a second case of untoward reactions following the injection of gold salts in a case of the erythematous type. Three injections of chrysalbine were given at weekly intervals. There was a rise of temperature after each injection and the general condition became poor. They then shifted to another form of gold, aurophos. The same untoward reactions followed, also with bleeding of the gums.

Gougerot and Burnier (*Bull. Soc. fran. dermat. et syph.* 36:64, 1929) report a case who was given a first course of 10 injections and a later second course of 20 injections. One month after the last injection the patient presented a severe purpura, bleeding from the gums, hematemesis, hematuria and metrorrhagia. Four days after the onset of these symptoms the patient died.

Gougerot, Burnier and Uhrey report (*Bull. Soc. franc. dermat. et syph.* 36:364 (April) 1929) a case in which the patient nine days after the second injection of a gold salt developed an erythematous eruption on the trunk associated with fever, nausea and vomiting and diarrhoea. The reporters consider this reaction analogous to that seen after arsphenamin.

GOLD THERAPY IN OTHER DISEASES

Gold has been used in the treatment of a few diseases other than lupus erythematosus.

At a meeting of the Cuba Dermatological So-

ciety August 2, 1928 (reported *Arch. of Derm. and Syph.* 17:2 (Feb.) 1929) Dr. Saenz showed a patient who had had psoriasis for 14 years and to whom he had given four injections of a gold compound, one a week. The doses were, respectively, 0.005 gm., 0.008 gm., 0.01 gm., and 0.01 gm. After the fourth injection there developed headache, fever and intense pruritus. There appeared on the skin an erythemato-vesicular dermatitis which developed rapidly and later became eczematoid.

Grindon also reported a case of psoriasis treated by injections of gold sodium thiosulphate (Meeting St. Louis Derm. Soc. reported *Arch. of Derm. and Syph.* 18:6 (Dec.) 1928). The patient was a female, aged 27. The eruption had existed for 13 years. She was given gold sodium thiosulphate four times, Feb. 11 0.05 gm., February 18 and 25 and March 3, 0.100 gm. March 8, five days after the fourth injection, a papular pruritic eruption appeared on the arms. In two days the eruption had spread until it now involved practically the whole body and the face. The backs of the hands and wrists became red, swollen and infiltrated. The psoriatic patches became actively inflamed.

N. Toomey also reports a case of psoriasis treated by gold therapy (*Brit. J. Dermat.* 40:445 (Nov.) 1928). He used two preparations of gold, one a colloidal gold suspension, the other metallic gold. The results were not striking.

Schmidt has published an article on Lupus Erythematosus with Leukemic Observations (*Arch. of Derm. and Syph.* 20:2 (Aug.) 1929). He recites the case of a man, aged 30, with lupus erythematosus on forehead and cheeks. He had a basal metabolic rate of —17 and a blood picture which suggested a leukemia. He was given 18 injections of a gold preparation at irregular intervals. The eruption cleared up and the blood improved. There had been no recurrence in ten months.

In the *Archives of Dermatology and Syphilis* (20:1 (July) 1929) H. C. L. Lindsay published three striking cases of leucoderma treated by gold sodium thiosulphate. Case I was of a young man who, following sunburn, developed numerous white spots on the face. Gold sodium thiosulphate was given by intravenous injection. Improvement in the white spots was seen after the first injection of 0.030 gm. Subsequently, seven more doses were given, at weekly intervals, each dose being of 0.100 gm. By this time there was complete recovery. The lack of pigment could not be detected either by the eye or by the camera. Case II was that of a woman of 34 who had definite areas of vitiligo. Gold sodium thiosulphate in weekly doses of 0.050, 0.100, 0.100, respectively, brought about a complete return of pigment to the patches. Case III was that of a young man with vitiligo whose patches were also responding to the injections.

Lupus Erythematosus. Treatment of, with *Bismuth.* Nicholas, Lacassaque and Rousset. (*Paris Med.* 1:62 (Jan.) 1929).

The writers treated 17 cases of lupus erythematosus with bismuth hydroxide injected intramuscularly—with cures. They report that improvement was noticeable after four injections and that after from 8 to 15 injections the skin had become normal. In three instances there were slight recurrences which a few additional injections of the bismuth hydroxide sufficed to cure.

It is their conclusion that intramuscular injections of bismuth hydroxide is the best known treatment of lupus erythematosus. The remedy is well borne and is curative. It is superior to any other remedy.

LICHEN PLANUS

A most striking symposium on lichen planus is reported in the *Bulletin of the French Society of Dermatology and Syphilis.* (Vol. 34, 1927).

L. Brocq (page 507) calls attention to the atypical forms of lichen planus which, on the one hand, may imitate psoriasis and, on the other, cutaneous atrophies. At times, he says, it is not easy to distinguish between a lichen planus and a psoriasis because the earliest lesions of lichen planus are often erythemato-squamous and thereby resemble the lesions of psoriasis. Brocq says that this clinical fact has not been sufficiently recognized. Furthermore, in Brocq's opinion, the lichenoid type of parapsoriasis en plaques has quite as many affinities with lichen planus as with parapsoriasis.

Ravaut (p. 567) believes that lumbar puncture has a definite antipruritic effect; that, in some cases, a single puncture may cause the disappearance of the eruption, although in severe rebellious cases it may be necessary to withdraw 6 to 8 c.c. of spinal fluid three or four times before this result is obtained. Withdrawals are made in such cases at weekly intervals.

Pautrier (p. 571) confirms Ravaut's statement as to the antipruritic effect of spinal puncture.

Gouin and Bienvenue (p. 573) inaugurated a discussion upon the use of radiotherapy in the treatment of the disease. They favor the employment of the unfiltered Roentgen ray. Usually the tube is focussed on the fourth dorsal spine but when the eruption involves the legs they ray the region of the twelfth dorsal. The dosage is five Holtzknecht units.

In their opinion the deeply penetrating rays act upon the neuro-vegetative system and not directly upon the cord.

They report good results. In many cases, the pruritus is much relieved. In a majority, the eruption disappears in from one to three weeks.

Luste, Levy, Franchel and Juster (p. 591) use both filtered and unfiltered rays. With the filtered rays, they report, there were 32 cures and 8 failures. With the unfiltered rays, they obtained 10 cures and had 8 failures. Many of their cases responded to a single treatment. Others required three or four further treatments at intervals of one month between doses.

Gawalowski (p. 594) attempted to solve the

question which exists as to whether the irradiation of the spine acts upon the cord itself, upon the spinal ganglia or upon the parasympathetic fibres. Instead of raying the spine, as has been the custom, he rayed the axillae and the anterior surfaces of the thighs. He says that the results were quite comparable to those obtained by raying the spine. From this he concludes that the effects of irradiation are produced by the fibres of the sympathetic regardless of the place of exposure.

Laurent (p. 598) reports 4 cases treated by Gouin's method (unfiltered rays). He obtained 1 cure, 2 improvements, 1 failure.

Payenville and Billard (p. 598) treated 6 patients by irradiation, 2 after Gouin's method (with unfiltrated rays), 4 after Pautrier's method (filtration and cross firing). They prefer Pautrier's method. Their conclusion is that irradiation is the best method known for the treatment of lichen planus.

Prieto (p. 599), like Gawalowski, studied the effects of irradiation. He exposed large areas on the abdomen to the roentgen rays in 5 cases of lichen planus. The results were favorable. His conclusion was that the rays act upon the skin itself and that the region irradiated is not important.

Pautrier (p. 602) describes his method of irradiation. He gives a dose of 4 Holtzknecht units filtered through 5 mm. of aluminum and a crossfire. The exposure is made over the spine from the first dorsal vertebra to the fifth lumbar. He reports that he has treated 35 cases by this method with cure obtained in two-thirds. The itching was relieved rapidly. One dose sufficed to cure most patients but nine required a second from three to six weeks later. To date there has been but one recurrence.

He disagrees with Prieto that the effect of irradiation is due to the action of the rays upon the skin itself.

Pautrier (p. 618) also reports an interesting attempt to inoculate lichen planus in man. Twenty-one different subjects were used. Material from lichen planus tissue was both injected intradermally and also rubbed into scarified areas. The results were nil in all cases.

Emotional stress is often ascribed as a cause for lichen planus. Petges (p. 627) says that he never saw emotional stress produce any such result. He believes that the emotional strains seen in connection with the disease are the result of the disease and not the cause.

Pautrier and Diss (p. 631) report on their microscopical studies of the lesions of lichen planus. They found that a proliferation of the nerve fibrils associated with certain other pathologic changes in the nerve radicals were signs of the disease which preceded all others and were to be seen in the early developmental stage. They could not determine definitely the origin of these nerve fibrils nor decide whether the changes were of peripheral or of central origin.

Ramel (p. 635), in a discussion of the etiology of lichen planus, expresses the opinion that the vegetative nervous system plays a definite rôle.

Kogoj (p. 638), also discussing the etiology, advances the hypothesis that lichen planus is a dermatitis due to an unknown virus (or agent) working upon a peculiar soil, the hyperkeratotic diathesis. It is most probable, he says, that this diathesis is based upon an endocrinous dysfunction. This dysfunction, in turn, is subordinate to or associated with a congenital or an acquired functional abnormality of the autonomic nervous system.

Samberger (652) too believes in the theory of a hyperkeratotic diathesis. He maintains that most cases of lichen planus are an eczema which has been transformed into a lichen planus by the presence of a hyperkeratotic diathesis.

ALLERGY AND SO-CALLED ALLERGIC DISEASES

W. T. Sach has recently published (*Brit. J. Dermat.* 40:442 (Nov.) 1928) an article entitled "On the Psychic and Nervous Component of the So-Called Allergic Diseases." (See also Drake, below). In it Sach has tried to give a more satisfactory explanation of the allergic phenomena than is usually afforded. He does not think it enough to say that the symptoms are the product of sensitization to some protein. He wants to probe deeper than that.

In the course of his practice, Sach had been struck by the number of pruriginous skin diseases which were associated with some mental or emotional irritation. In many cases which had defied previous treatment he was able to remove the symptom of pruritus by means of hypnotism, without other treatment. Sach thought that the fact indicated an affection of the whole state of the organism. He argued that, while the signs may be limited to and manifested in a single special organ, nevertheless the question was one of the whole constitution. Recent papers seem to indicate a belief that the similarity of many allergic diseases may depend not upon the fact of allergy alone but rather upon a specific alteration of the autonomic nervous system. There are cases in which not the slightest sign of allergy can be demonstrated but which, nevertheless, present the same symptoms as are encountered in proved allergic disease, as, for example, cases produced purely by psychic factors. It is, further, an established fact that a correlation exists between the autonomic nervous system, on the one hand, and the endocrines, on the other. It is also an accepted fact that a malfunction can not exist in the one without a corresponding disturbance of the functions of the other.

Lyons reports a case of Allergy in an Infant Three Weeks Old (*Am. Dis. Children* (Chicago) 36:1012 (Nov.) 1928.) The case presents several interesting features. The first is the age of the child. In spite of the fact that investigations have declared that three weeks is about the time that inherited sensitization first becomes manifest Lyons classes the condition as acquired

rather than as inherited or congenital. The second point of interest was the demonstration of allergens in the mother's breast milk to which the infant was sensitive. Strangely, the protein skin tests were negative in the mother but positive in the child. White navy beans gave a positive reaction in the child and were still positive two years later. Withdrawal of the offending protein and the oral administration of epinephrine solution (1:1000) gave the best results therapeutically.

J. A. Drake (*Brit. J. Dermat.* 40:407 (Oct.) 1928) writing on the Eczema-Asthma-Prurigo Complex, holds much the same view concerning the etiology as Sach (given above). Drake believes that the underlying, or basic, factor in the production of eczema is an inherent, or possibly, acquired, dysfunction or disharmony of the autonomic nervous function.

R. Cranston Low (*Brit. J. Dermat.* 40:389 (Oct.) 1928) on the other hand believes in the sensitization theory. He thinks that, because both chronic eczema and asthma give positive reactions to various proteins, therefore, the cases of combined asthma and eczema are due to the same proteins. He states that it is the experience of those who use the sensitization tests that the younger the patient the more frequently it is food proteins which are responsible for the disease while in later life it is animal emanations, dust and bacterial antigens which play the major etiological rôle. He calls attention to the relationship to dermatitis venenata which this group bears.

Joseph V. Klauder and Herman Brown have published a third paper on their researches into conditions prevailing in eczema. (*Arch. of Dermat. and Syph.* 19:1 (Jan.) 1929.) In this paper they discuss the rôle of the sympathetic nervous system and the calcium-potassium ratio in altering cutaneous irritability.

Klauder and Brown start with the conclusion established in their last research, i.e.: that the calcium potassium balance bears a direct relation to the irritability of the skin. Their work seems to have determined the fact that a peculiar demonstrated that the ratio of calcium and potassium salts in the skin. It seems to have been demonstrated that the ration of calcium and potassium is concerned in altering cutaneous irritability and plays an important part in establishing sympathetic and parasympathetic equilibrium. They have shown that there seems to be an inverted relation between the degree of irritability and the amount of calcium. They found that a lesser degree of instability in the skin foretold the presence of a high calcium content and a low potassium content. Conversely, the more pronounced the irritability of the skin the greater the likelihood of a low calcium content and a high potassium.

E. Lehner reports a case of urticaria due to cold (*Klin. Wchnschr.* 8:306 (Feb. 12) 1929). A man, 23, after bathing in cold water suddenly complained of headache, chills and a burning sensation in the skin. When taken from the water he was almost unconscious. His skin became swollen, reddened and itchy. Ice applied to the skin anywhere caused swelling, redness and itching. A piece of ice taken into the mouth caused wheals on the palate and tongue.

Michelsen and Kersten (*Arch. of Derma. and Syph.* 19:1 (Jan.) 1929) would explain the tuberculoid structure of tertiary syphilitic lesions on the ground of an allergy. They state that the tuberculoid structure is, as a rule, absent in the chancre, unless it is left untreated for several months. It is practically never found in the macules or the papules. As the infection becomes older there is a distinct tendency for the inflammation to change to the tuberculoid form. When the disease is in the tertiary stage, active syphilitic lesions will, almost invariably, present a tuberculoid structure. The authors explain this development on the theory of the presence of a definite state of allergy and to the existence of a high degree of tissue response. They believe also that the comparative absence of syphilitic organisms is but another proof that there exists, in the third stage of the disease, a distinct allergic state.

Gougerot, Peyre and Bertilton (*Bull. Soc. fr. de dermat. et syph.* 35: 530, 1929) report a new treatment for urticaria and other so-called anaphylactic or allergic diseases. This treatment consists of the intravenous injection of the eosinate of cesium, given either every day or three times a week, in doses of 10-15 c.c. of a 10% solution. The results are said to be encouraging.

Althausen and Shumaker (*Arch. Int. Med.* 40:85 (Dec.) 1927) enthuse over the action of ephedrine in allergic diseases. Of a total of 15 cases tested, they secured a brilliant recovery in 1 case of toxic erythema, a good result in 7 cases of urticaria and doubtful results in 2. Three cases of angioneurotic edema similarly treated were all therapeutic failures.

R. M. Balyeat (*J. Lab. Clin. Med.* 13:1019 (Aug.) 1929) recommends doses of 6 to 12 minims of epinephrin for the temporary relief of urticaria due to food poisoning, of serum sickness and of insect bites. If the symptoms are more severe, as for example, severe abdominal pain or swelling of the tongue or soft palate, the dose should be increased to 10-15 minims.

LEPROSY

The progress in the care of leprosy continues. Whereas not many years ago the disease was considered almost incurable, now, from many quarters, come reports of cures in considerable numbers and also the expressed hope that leprosy may eventually be eradicated.

The report of the British Empire Leprosy Relief Association for 1928 is an example of the new attitude toward the disease. According to the report, Dr. Muir of the Calcutta School of Tropical Medicine estimates that there are in India alone from one-half million to one million lepers. The favored treatment is by the injec-

tion of sodium hydrocarpate. Its success continues. The Association dares to say that it is convinced that if the plans advocated by the Association can be pushed with determination "there is a possibility of seeing the last of leprosy, at least in many parts of the empire, within the next thirty years."

The Australian letter (*J. A. M. A.* 92:15 (April 13) 1929) repeats the same encouraging note. The correspondent writes that the commissioners appointed by the League of Nations to investigate leprosy in the South Pacific have reported that at the British settlement for lepers at Makagai and at the French settlement at Ducos they are discharging inmates as cured at the rate of thirty a year.

Dr. Ralph Hopkins and Dr. Oswald E. Denny have made a statistical study of the seven hundred cases in the national leprosarium (*J. A. M. A.* 92: 3 (Jan. 19) 1929). The results are both interesting and informing. The article is too long to review here so that we must be content with a brief summary.

The statistics of this national institution to whose population all the states contribute gives a very good idea of the centers of infection. Most of the inmates come from five states, Louisiana, California, New York, Texas and Florida. Of these only New York can be considered a northern state as regards climate.

Of the total cases, 11% were of the nerve type, 39.1% of the skin type and 49.9% of the mixed type.

The average age at the onset of the disease was computed to be 30.2 years and the duration of the disease at the time of admission at 6 years. For six years then the average patient had been a possible source of infection to the public.

In 64% of 100 Louisiana lepers there had been but one case in the family. In 36% there had been more than one. In two or three instances "the disease has invaded certain branches (of the family) to the point of extermination." Usually the parent was infected before the child but it happened not infrequently that the reverse was the case.

Intimate contact for years seems to have been necessary for the transmission of the familial disease. The approximate duration of the stage of incubation seems to be about six years for the average case, all types considered.

The report states that the maximum number of males developed leprosy at the age of 21 and the maximum number of females at 19. The writers state that it is interesting and perhaps significant that "the age at which susceptibility may be inferred to be at its maximum is approximately the age of puberty." Before the age of 9 leprosy seems to be rare.

The primary manifestations were, in the majority, on the face.

The average duration of the disease was about 14 years.

THALLIUM

This drug is still used to epilate in cases of ringworm of the scalp. With experience, however, has come caution. The *Journal of the American Medical Association* (93:122 (July 13) 1929) comments editorially on three deaths from thallium reported in the *Deutsche Zeitschrift fur die gesamte gerichtliche Medizin* (13:237, 1929).

Leighel studied the toxic properties of thallium (*Gior. ital. di dermat et sifil.* 69:960 (June) 1928). He found thallium was an extremely powerful poison which causes profound alterations in all the organs and in the nervous system. He states that the alterations in the endocrine glands were sufficiently marked to justify the conclusion that the alopecia-causing property of thallium depended upon its action on the ductless glands and especially on its action on the thyroid, as that organ showed more signs of damage than the others.

MISCELLANEOUS

Dermatitis Venenata

Templeton (*Arch. of Dermat. and Syph.* 20:1 (Sept.) 1929) reports four cases in which unfavorable reactions followed the injection of the antigen of poison oak. The reactions were urticarial in their nature and were both local, at the site of injection, and generalized over the whole body. The local type manifested itself within twenty-four hours. The general type sometimes began at the site of injection and thence spread over the body and sometimes was generalized from the outset. With the latter type papulovesicles were encountered. Pruritus was intense. Sometimes the symptoms were so severe as to necessitate hospitalization.

Herpes Zoster

Glaubersohn and Villfaud (*Ann. de dermat. et syph.* 10:609 (June) 1929) studied the inoculability of the virus of zoster. With the fresh contents of fresh vesicles they obtained successful inoculations and reinoculations but with the spinal fluids of zoster they obtained no results. Hence they concluded that zoster is an infectious disease and that the skin is the port of entry.

Seborrhoea.

Dr. Francis M. Duffy, Associate Professor of Bacteriology and Pathology, Creighton University School of Medicine, declares that seborrhoea is a coccus disease and is transmissible (*Arch. of Dermat.* 20:3 (Sept.) 1929). He reports that he has succeeded in isolating gram positive cocci, arranged in diplococcus and tetracoccus positions, from cases of seborrhoea. Inoculations of guinea pigs produced, after three weeks, seborrhoea-like scales about the bases of the hairs. From these scales, without an exception, the original organism was recovered and was demonstrated to be the same morphologically as that used for the original inoculations.

Roentgen Sarcoma

Alius (*Beitrage z. klin. Clin. Berlin* 143:567, 1928) relates the story of an extraordinary case in which he had been able to watch and to study the developments from the start. It concerned a man who for seventeen years had been undergoing roentgen ray treatment for lupus vulgaris. At the end of that period a spindle cell sarcoma developed at the site exposed to the rays. There were four recurrences in the skin all of which were excised. Following the fourth operation the man began to complain of pain and of bloody stools. He died within three months, that is, within eighteen months after the first tumor was noticed. The autopsy revealed multiple metastases in nearly every region of the body.

Psoriasis

Wauchiak (*Arch. Derm. and Syph.* 19:5 (May) 1929) is quite impressed by the possibility that there is a relationship between the occurrence of monilia in the intestinal tract and the occurrence of psoriasis in the skin. It is an already known fact that monilia are found in the intestinal tract of from 5 to 10% of normal persons and that in the presence of intestinal disease its occurrence is raised to 15-40% while in cases of pernicious anemia its presence in the feces is almost constant. The writers examined 32 cases of psoriasis. They found monilia in the stools in 90%, in the blood in 10% and in the skin scrapings in 2%. Their attempts to reproduce the disease in animals were failures although in 2 out of five cases so tested they recovered pure cultures of monilia from the inoculated areas. In tests of the sensitiveness of psoriatic skins to monilia, 77% yielded positive results to an emulsion applied to an abraded skin and 100% showed a distinct reaction. Vaccine treatment with monilia vaccine seemed to improve a certain number but not the majority.

Skin Cancer

F. Dantwitz (*Strahlentherapie* 29:634 (Aug. 15) 1928) reports 186 cases of cancer of the skin treated by radium. All but nineteen cases were of the face. Dantwitz believes in the beta-rays even for the treatment of superficial, ulcerating processes and it was with this ray that he treated the cases reported. He does not agree that the beta-rays act as a pure caustic destroying both diseased and healthy tissue. He obtained fine scars, cosmetically considered. He did not encounter a single case of ulcerated skin cancer which did not respond to the beta-ray. His method is to give from two to eight treatments with fractional doses. Each treatment consists of an exposure of from four to eight hours with intervals between treatments of from twelve to thirty-six hours.

Exfoliative Erythroderma

P. Unna, Jr. (*Dermat. Wchnschr.* 87:1317 (Sept. 22) 1928) reports five cases of exfoliative erythroderma with cure. Unna states that modern research has demonstrated that this affection is not a disease sui generis but is an injury of the vegetative nervous system. The causes are multiple. He argues that his five cases prove that point; first, because the primary disease differed (some were primary cases of the Wilson-Brocq type. Others were secondary to seborrhoeic eczema or psoriasis); because a relatively simple treatment acting on the autonomic nervous system was enough to cure the symptoms both of the skin and also of the internal organs. Unna used an ointment whose most active ingredient was epinephrin. The hypothesis of treatment was that the disease picture was that of a peripheral vascular paralysis. Hence it followed that if one could relieve the paralysis he could relieve the symptoms of disease. With the epinephrin ointment he cured the five cases.

Stocking Erythroderma

L. Harlston describes a "Stocking Erythroderma" which he believes is a clinical entity (*Brit. J. Dermat.* 41:105 (March) 1929). He had observed 15 cases, 14 of which were in men. The disease affects only the lower legs or the lower arms, sometimes both, but never any other parts of the body. On the arms it never extends above the elbows or below the wrists. On the legs it never extends above the knees or below the top of the foot. The skin presents a red, scaly aspect, often a moist and eroded condition. Harlston likens the affection to the glove and stocking anesthesia of the hysterical to which he thinks it is strictly analogous. All of his patients were hystericals.

Case Records
of the
Massachusetts General Hospital

ANTE-MORTEM AND POST-MORTEM RECORDS AS USED IN WEEKLY CLINICO-PATHOLOGICAL EXERCISES

EDITED BY R. C. CABOT, M.D.

F. M. PAINTER, A.B., ASSISTANT EDITOR

CASE 16051

ASCITES IN AN ELDERLY MAN WITHOUT HISTORY OF ALCOHOLISM

MEDICAL AND SURGICAL DEPARTMENTS

A Swedish carpenter sixty years old entered the hospital June 12 complaining of abdominal pain and soreness and general weakness of six months' duration.

In December, six months before admission, he began to feel tired in the afternoon, lost his appetite and had to stop work. After a rest he improved somewhat, but he had never returned to work. In January he developed a heavy "cold" in his chest, though he had only slight cough and no sputum or fever. The "cold" continued for almost two months. He lost weight and strength and was troubled by indigestion and anorexia. Four months before admission he began to have alternate constipation and diarrhea. Recently he had been taking cod liver oil and his bowels tended to be loose. He began to have slight pain and stiffness in his joints. For two months he had had dull steady pain in the epigastrium, worse for two or three hours after eating and aggravated by bending over, and soreness all over the abdomen. His abdomen had increased steadily in size. His stomach felt full most of the time. He had passed small amounts of urine three or four times at night. For three weeks he had been unable to move about much because of weakness and shortness of breath. "Every breath caused pain in the abdomen." His ankles had been swollen most of the time. He thought he had lost forty pounds since the onset of the illness.

His mother died in Sweden of "quick consumption" twenty-five years after he came to America. His eldest daughter also died of tuberculosis.

He had scarlet fever at eighteen years. He formerly had frequent sore throats and colds, none recently. Three years before admission he had some bones broken in an automobile accident, was unconscious for several hours, and was in a hospital for nine weeks. A month before admission he had some itching of the skin lasting for three weeks.

Clinical examination showed an emaciated man, obviously very weak, with dusky skin and pale mucous membranes*. Tonsils large. Fine tremor of tongue. Visible and palpable pulsation of innominate artery in the substernal notch. Apex impulse of the heart felt in the fifth space 9 centimeters to the left of midsternum, 1.5 centimeters outside the midclavicular line, coinciding with the left border of dullness. Right border of dullness 1 centimeter, supracardiac dullness 4. The right radial pulse was barely felt, much less strong than the left. Artery walls palpable and tortuous. Blood pressure 125/80 to 120/90. Diaphragm high, especially on the right. Breath sounds throughout the chest harsh. Occasional crepitant râles at both bases. Abdomen markedly swollen, with dullness throughout except for tympany over the highest point. Shifting dullness and fluid wave. Ironing out of the umbilicus. No masses or organs palpable owing to tenseness of the skin. Tenderness throughout the abdomen. Hypertrophy of joints of hands. In creases and on joints of the body and arms was mottled brown pigmentation.

Before operation urine normal in amount and specific gravity, no albumin, the slightest possible trace of sugar at one of four examinations, rare to occasional leukocytes at three. Blood before operation: hemoglobin 70 per cent, reds 4,100,000, achromia, marked anisocytosis and poikilocytosis and a few tailed forms, platelets increased, 9,700 to 14,350 leukocytes, 87 to 77 per cent polynuclears. Hinton negative. Abdominal tap June 12, 6 liters of greenish-yellow fluid, specific gravity 1.020, cell count 2,500, 90 per cent lymphocytes, culture, no growth. Fasting contents of the stomach, 20 cubic centimeters of blood streaked seromucinous material, no free acid, total acidity 8, guaiac very strongly positive. Test meals: after half an hour 15 cubic centimeters of seromucinous material, no free acid, total acidity 6, guaiac positive; at one hour 20 cubic centimeters of similar material, free acid 10, total acidity 18, guaiac negative. June 19 liver function test showed no retention. Icteric index less than 2. June 24 another abdominal tap gave 29 cubic centimeters of slightly cloudy greenish yellow fluid, specific gravity 1.017, 600 leukocytes, 80 per cent lymphocytes, no red cells.

X-ray examination with a barium meal showed the stomach small, high and displaced to the right. Peristalsis was active. The stomach emptied rapidly. It showed no deformity of outline. The pyloric sphincter and the first portion of the duodenum appeared normal. At the end of six hours the meal was seen scattered through the small bowel. There was no positive evidence of barium in the colon. There was evidence of a considerable amount of gas in the abdomen some of which seemed to be in the small bowel. The left upper flank was dull. A twenty-four hour examination showed nothing defi-

*Note by Dr. William R. Jordan, senior interne on the West Medical service: In spite of the pallor there was a malar flush

nitely abnormal. On examination with a barium enema the barium passed to the cecum without delay. The splenic flexure was displaced downward and somewhat to the right; otherwise the colon was negative. The appendix was visualized and appeared normal. Examination of the chest showed the diaphragm rather high on both sides and sharply outlined. Respiratory movements were limited on the left, absent on the right. In the third interspace on the left, about the middle of the chest, there was a small area of increased density, probably of no pathologic significance. The heart shadow was horizontal in the chest, probably because of the high position of the diaphragm. It was not definitely enlarged. There were no mediastinal masses. Examination of the chest showed no positive evidence of disease. There was nothing in the lungs to explain the high position and fixation of the diaphragm. The hands showed considerable general deformity and some soft tissue thickening. The bones of the hands showed moderate atrophy, but otherwise appeared normal.

Before operation temperature 97° to 100.2°, pulse 76 to 118, respirations normal.

An abdominal examination made by a surgeon after the paracentesis June 24 was negative except for fluid and a slight possibility of a mass in the right upper quadrant. He advised exploration. One of two physicians agreed. June 26 operation was done. The next morning the patient was in fair condition. This suddenly changed. The pulse rose to 140. The temperature remained normal. Before noon he died.

Clinical Discussion

BY RICHARD C. CABOT, M.D.,
GEORGE W. HOLMES, M.D., AND
WILLIAM R. JORDAN, M.D.

NOTES ON THE HISTORY

Alternate constipation and diarrhea always make us think of an intestinal lesion, especially of neoplasm.

None of the events in the previous illnesses are such as we can connect in any way with the present illness. His present trouble sounds like digestive trouble, and more like cancer of the stomach than anything else in my mind.

NOTES ON THE PHYSICAL EXAMINATION

My guess is that he had a deeply placed radial artery in one wrist, as people often do have. People are sometimes thought to be very ill because a doctor or a nurse cannot feel a pulse which is abnormally placed. So far I see no reason to think it means more than that.

We have a secondary anemia, one of the features which one should expect in any of the diseases to be considered in this differential.

The specific gravity of the abdominal tap fluid is rather notably high.

No dye retention means no evidence of liver disease.

Dr. George W. Holmes: This film does not show the small, high and displaced stomach very well. But you can see this lighter shadow which represents the stomach pushed up under the liver and rotated so that we are looking on the greater curvature. At least we can say that the stomach is not dilated and that there is no obstructing lesion in the stomach and be quite sure of it. We might very easily miss a lesion high up in the cardiac end of the stomach or lesser curvature because the stomach is so rotated that it is difficult to see that portion. The stomach is so high and the belly so full of fluid that it would be difficult to find on palpation. So far as they could make out in the fluoroscopic examination there was nothing abnormal. They were probably able to see the lower end of the stomach fairly well. Normally the barium column should be in the cecum at the end of six hours. Frequently it is in the middle of the transverse colon. So that we have a delay in the passage of the meal through the small bowel. Obstruction in the small bowel is very difficult to demonstrate by X-ray. You can have a tumor in the small bowel and miss it completely. It is probably due to paralysis,—he had fluid in the abdomen, perhaps peritonitis,—not to failure of the peristaltic activity of the bowel. That would account for all the slowing up that we see.

As a rule we do not see gas in the small bowel. It is common in the stomach and the large bowel. Gas in the small bowel usually means stasis or obstruction.

This film shows the appendix very well. An appendix which you can see as well as that certainly is not very badly diseased. So far as we can make out from these films or from the examination there is no demonstrable lesion in the gastro-intestinal tract. We have to take into consideration the type of patient. This is not a very satisfactory case to examine. We are more likely to make a mistake in a patient who has fluid in the belly.

This is the film of the chest. You see the sharply outlined diaphragm. The short distance from the apex to the base shows that the diaphragm is high. I do not see much difference in the two sides. The diaphragm on the right should normally be higher than that on the left. We do not get complete absence of diaphragmatic motion unless there is inflammation directly beneath it.

Dr. Cabot: That lung shadow is not a metastasis?

Dr. Holmes: I think not.

I think that was a normal shaped and normal sized heart for that type of chest.

We naturally suspect something below, as there was nothing in the lungs to explain the high position and fixation of the diaphragm.

I cannot go any further than they have gone in the note. I should suspect some process below the diaphragm which did not involve the gastro-intestinal tract.

DR. CABOT: Could ascites account for the high position and fixation of the diaphragm?

DR. HOLMES: It could account for the high position but not for the fixation. We should have some motion. But I should add that the observation was made during the fluoroscopic examination. The observers in our clinic are constantly changing. Sometimes they are very good; sometimes not so good.

DR. WILLIAM R. JORDAN: The abdomen had been tapped before that examination.

DR. CABOT: So we know that fixation was present after the abdomen was emptied. What are some things besides subdiaphragmatic abscess that can bring about this fixation of the diaphragm?

DR. HOLMES: Diaphragmatic pleurisy could, also paralysis of the phrenic nerve, or severe pain on respiration; but as a rule the diaphragm is not absolutely fixed.

DR. CABOT: I do not see evidence of any of those things unless it is subdiaphragmatic abscess, and I have not much evidence for that. I am very much in the dark.

A STUDENT: Would a tumor mass below the diaphragm do that?

DR. HOLMES: No, not unless there was some infection.

DIFFERENTIAL DIAGNOSIS

DR. CABOT: I have little more to add. I have an idea this man had malignant disease below the diaphragm. I thought at first that it was in the stomach, but there is no evidence of it. This same achylia, or pretty nearly complete achylia, can occur with many other diseases. I understand that nothing was felt in the abdomen even after tapping?

DR. JORDAN: No.

DR. CABOT: So we have no evidence of a tumor. I can only balance certain rather vague possibilities there. We start with the fact of ascites, one thing that we are sure of. Ascites can be due to disease of the heart or kidney, of which we do not see any evidence here. Cirrhosis of the liver, tuberculous peritonitis and malignant disease are the other common causes of ascites, but we have no very good evidence of any of those. On the whole there is more pointing to malignant disease than anything else, but there is no way of localizing it. We tried localizing it in the bowel by all the means we could. I do not see any reason why it should be in the stomach, the liver, or the retroperitoneal glands.

DR. JORDAN: Do you care to see the chart?

DR. CABOT: That seems to me an essentially normal chart, which ought to go far to exclude any sort of infection. That chart is distinctly against it, as is the leukocyte count on the whole. If we are thinking of tuberculous peritonitis, that chart is against it.

A STUDENT: Could it be carcinoma of the liver?

DR. CABOT: I should not suppose so. A carcinoma of which a man dies should show some local signs.

A STUDENT: Was the spleen enlarged?

DR. JORDAN: It was not felt.

A STUDENT: Is that high gravity ascitic fluid of any significance?

DR. CABOT: It goes with malignancy or tuberculous peritonitis. It is against the diseases producing dropsical fluid, heart or kidney disease.

We have not discussed cirrhosis. I do not know that it can be excluded. We do not need to have a history of alcoholism. We do not need to feel the liver. He had blood in the stomach contents, which might be attributed to that.

A STUDENT: He had a history of tuberculosis in the family.

DR. CABOT: Whether he was exposed to it we do not know. But I should say that chart is enough to exclude tuberculous peritonitis. Also I do not believe he would have died so quickly with tuberculous peritonitis. Such an operation as they would do would not kill him. In malignant disease it does not take much to kill a patient.

On the whole, then, I think it is malignant disease below the diaphragm. I have no idea why the diaphragm was fixed. I do not believe it was a subdiaphragmatic abscess. It has to be put down as a mystery that the diaphragm was fixed.

A STUDENT: How do you account for the brown pigmentation? Could it be melanotic sarcoma?

DR. CABOT: I do not think so. It does not seem to me like pellagra; it does not seem like Addison's disease or any other cause of pigmentation that I know. Pigmentation does go with lymphoma, Hodgkin's disease. When you are suspecting malignant disease and cannot place it, lymphoma is a good guess because it can be in queer places that you cannot easily reach. I think it well to hang it up on the hook of things to be thought of.

A STUDENT: Will amyloid produce this picture?

DR. CABOT: It does not kill a man, and does not produce ascites. I should not seriously consider amyloid.

A STUDENT: Would tumor of the adrenals, Addison's disease, account for it?

DR. CABOT: I have never known it to cause this kind of pigmentation. He did not have any other symptoms of Addison's disease. On the whole I am ready to say he did not have Addison's disease.

A STUDENT: Is this cloudy greenish-yellow fluid characteristic of anything?

DR. CABOT: Nothing that I know.

What was the diagnosis in the wards?

DR. JORDAN: The diagnosis was tuberculous peritonitis.

We sent him to the surgical service. One visiting surgeon reported: "I think malignancy more likely than tuberculous peritonitis. Ab-

dominal palpation immediately after paracentesis abdominis would be illuminating." Another reported: "Abdominal examination negative except for fluid and a slight question of a mass in the upper quadrant. Advise exploration to determine diagnosis."

DR. CABOT: I am against tuberculosis on the evidence of the chart. Nothing else seems to have been considered except what you and I have considered.

DR. JORDAN: The temperature ran up to 100°. He was a man of sixty. Don't people of that age have less febrile reaction than usual?

DR. CABOT: That is true. An infection might cause less fever, might cause less reaction than in a younger man. That is a good point and perhaps neutralizes what I said about the absence of fever as a point against tuberculous peritonitis.

A STUDENT: Could tuberculous peritonitis going up over the liver account for adhesions causing fixation of the diaphragm?

DR. CABOT: I should not like to say that it could not. Dr. Holmes, have you seen a fixed diaphragm with tuberculous peritonitis?

DR. HOLMES: I think not.

DR. CABOT: The points which Dr. Jordan has brought out have weakened my diagnosis and made tuberculosis seem more probable. But I still think it is malignant disease. Whether he had tuberculosis or whether as the surgeon thought he had cancer is now for Dr. Mallory to say.

INTERPRETATION OF X-RAY

There is apparently a mass in the region of the left upper flank displacing the stomach and intestinal contents downward and to the right.

PRE-OPERATIVE DIAGNOSIS

Malignancy of the stomach.

OPERATION

On opening the abdomen the stomach was found to contain a tumor in its center, in the central third, which was bound down posteriorly, making excision impossible. A gland was removed for diagnosis.

POSTOPERATIVE DIAGNOSIS

Malignancy of the stomach.

PATHOLOGIC REPORT

A small strip of peritoneum showed tuberculosis.

BACTERIOLOGIC REPORT

A guinea pig inoculated June 12 with fluid from abdominal tap showed tuberculosis.

CLINICAL DIAGNOSIS (FROM HOSPITAL RECORD)

Tuberculous peritonitis.

DR. RICHARD C. CABOT'S DIAGNOSES

Probably malignant disease below the diaphragm.
Possibly tuberculous peritonitis.

ANATOMIC DIAGNOSES

1. *Primary disease.*

Tuberculous peritonitis.

2. *Secondary or terminal lesions.*

Old caseous tuberculosis of the lower lobe of the right lung and of the bronchial lymph glands.
Splenomegaly.

PATHOLOGIC DISCUSSION

BY TRACY B. MALLORY, M.D.

The stomach at autopsy was entirely negative. There was generalized tuberculous peritonitis. The spleen was very large, weighing 600 grams. I think that probably accounts for the displacement of the stomach. There were not many fibrous adhesions. Unfortunately I do not find any notes as to whether or not tuberculous lesions extended up over the dome of the liver between it and the diaphragm. I think they very probably did, since the process was a diffuse and generalized one. There were two older foci of tuberculosis, one in the right lower lobe, a peculiar location, and the other in the bronchial glands. Both seemed to be old caseous lesions without particular evidence of activity. We could not find tuberculous lesions in the intestines. The way the process spread to the peritoneal cavity remains a mystery.

DR. CABOT: Dr. Wolbach says he has found an unusual number of cases of tuberculous peritonitis in elderly people recently. We usually think of it as one of the diseases of childhood. Have you found it in older people here recently?

DR. MALLORY: I remember very vividly a statement Dr. Erdheim made in Vienna. He said the tuberculosis of old age is exactly like the tuberculosis of infancy. The types of tuberculosis found in old age are the generalized, glandular tuberculosis, miliary tuberculosis and peritoneal tuberculosis. These types of tuberculosis, which are the rule in infancy and childhood, practically disappear in middle age and become fairly common again in old age. I certainly do not know any text book of medicine in English which makes any such statement. We have picked up at least half a dozen cases of acute tuberculosis of either glandular or miliary type in quite old people.

DR. CABOT: I think the class will remember the big abdominal glands Dr. Wolbach showed us last week in a similar elderly patient.

CASE 16052

A RARE TUMOR ILLUSTRATING THE IMPORTANCE OF STUDY OF ALL GENITAL SWELLINGS AND OF OPERATING UPON THOSE WHICH CANNOT BE PROVED INNOCENT

Urological Department

A Canadian bookkeeper twenty-five years old came to the Out-Patient Department December 12 complaining of a swelling in the right scrotum of a year's duration.

The swelling had come on spontaneously without a history of trauma. It had steadily increased in size. For two weeks following the onset it had been very painful. There had been no pain since.

Three years before admission he had retention relieved by catheterization.

There was a family history of tuberculosis in an uncle and a brother.

The patient was suspected of having tuberculosis seven years before admission and was in a sanitarium for two months. At present his doctor found no signs of an active process, although the patient was underweight and weak. He denied lues by name and symptoms.

He gave an additional history of redness at the onset of the swelling, subsiding with the pain after two weeks. Since the onset he had had frequency of urination twelve to fifteen times by day, but no nocturia. He had had burning micturition nearly constantly for the past year. He sometimes had pain in the right groin and down the inner side of the right thigh. He had lost ten pounds in the past three months, felt weak and had lost appetite.

At thirteen he had "rheumatism" in his chest, recurring every spring for five years and lasting two or three months each time. For seven years he had had no such trouble. Nine years before admission his tonsils were partially removed. He had occasional sore throat. He had some pain in the left chest radiating to the left shoulder and down the left arm to the hand, not related to exertion. For many months he had had dyspnea and occasional orthopnea. For several years he had had frequent epigastric distress, usually coming on two hours or more after meals and at night, or in the morning before breakfast, relieved by food, milk or soda. He occasionally regurgitated very sour material and had much gas.

Clinical examination showed a fairly well nourished man. Lungs not remarkable except for slight dullness at the left apex posteriorly. Heart sounds not well heard. No measurements are recorded. Rate regular. No murmurs. Right kidney possibly felt on deep inspiration. No tenderness. Questionable glands in the right abdomen along the spine. There was a mass the size of an orange completely filling the right scrotum, smooth, firm and not tender. It did not diminish in size in the prone position, did not transmit an impulse on coughing, nor did it transilluminate. The epididymis could not be palpated. A tap with a needle and syringe was negative. Extremities, pupils and reflexes not remarkable.

Before operation amount of urine not recorded, specific gravity 1.010, no other abnormalities. Blood Wassermann was negative.

Chart before operation normal.

X-ray examination of the pelvis, the lumbar region and the chest showed no definite variations from the normal.

December 23 operation was done.

Discussion

BY OSCAR F. COX, JR., M.D.

The outstanding physical finding is a mass in the right scrotum. Young states, "Every enlargement of the scrotal contents is worthy of careful study by the physician, and enlargement of either testicle or epididymis should be viewed with suspicion and generally operated on."

Hernia, varicocele and hydrocele, common causes of scrotal enlargement not connected with either the testicle or the epididymis, can in this case be ruled out.

Epididymitis, gumma, hematocele and tumor should all be considered. The term "enlarged testicle" is many times carelessly used when the existing pathology is confined entirely to the epididymis. It is important to distinguish between the two, but in the presence of much fluid this cannot always be done. Careful tapping of the scrotum is sometimes justifiable, after which the contents can usually be identified.

The family history of tuberculosis, his past history of suspected tuberculosis (presumably pulmonary), the loss of weight and appetite, the frequency of urination with burning and the swelling in the scrotum strongly suggest genital tuberculosis. However, examination showed that the testicle and not the epididymis was involved, and as tuberculosis only rarely involves the testicle and then only secondarily to the epididymis, it can be ruled out.

The negative blood with the negative history probably means that gumma is not present. It is well to bear in mind that a positive blood does not rule out tumor. An otherwise nonexplainable enlargement of the testicle with a positive blood should be given a short intensive course of antiluetic treatment. But if no improvement is noted within a week or two the possibility of tumor should be considered and exploration insisted upon.

Two types of hematocele are recognized, the traumatic and the spontaneous. With the first we get the history of trauma with a rapid painful swelling which does not transilluminate. In the second type the history does not help. The swelling is much more gradual, and we are con-

fronted with a slowly growing mass which may or may not be tender, looks and feels like a hydrocele, but does not transilluminate. As a rule this condition cannot be differentiated from a neoplasm. Spontaneous hematocele is however extremely rare. The diagnosis of tumor of the testicle without metastasis must be made largely by exclusion.

Tumors of the testicle are comparatively rare. Most of the reported cases have occurred in men between the ages of twenty and fifty. I recall about one year ago having seen a case of a man in his early thirties who had been aware of a swelling in one testicle which was his only complaint for only three weeks previous to consulting his physician. He was found to have a teratoma with metastases to the pelvis and the lungs. In November, 1929, a man of thirty-four was admitted to this hospital who was found to have teratoma with metastases to the abdomen. His history had been painless swelling in the left scrotum and a pain in the back for six months previous to admission.

Tumors of the testicle are practically always unilateral, and the right and left sides are about equally affected. The appearance is that of a smooth, rounded mass which is not tender. It is unusual for the tumor to extend through the tunica albuginea, but if this does happen involvement of the scrotum will cause metastasis to the inguinal lymph nodes. Otherwise these nodes are not involved. The usual metastases are to the retroperitoneal nodes, the lungs and the cervical glands.

All testicular tumors should be considered malignant. They may remain benign for years and then suddenly show signs of malignancy. No one can tell when this may happen. Cases have been reported which after remaining quiescent for five years suddenly began to show rapid growth. There are also records of tumors which have grown to the size of a large grapefruit within six months after their appearance. Most of the reported cases of testicular tumors have proved to be some form of teratoma. In lieu of a definite diagnosis of some other condition all swellings of the testicle should be operated upon.

Our diagnosis in this case is teratoma of the right testicle.

It may be of interest to add that this man was reluctant about submitting to any surgical procedure. Two visits to his home by the Social Service and considerable persuasion by members of the Urological staff finally brought about his consent.

PRE-OPERATIVE DIAGNOSIS

Teratoma of the testicle.

OPERATION

Under ether anesthesia a small incision was made in the upper portion of the right scrotum. The contents of the scrotum were delivered into the wound. The cord was isolated without opening the tunica vaginalis, clamping, cutting, and ligating with number two continuous catgut. A stab wound was made in the bottom of the scrotum and a Miller wick inserted through this for drainage. The scrotum was closed in layers in the usual manner.

PATHOLOGIC REPORT

Cystic teratoma, non-malignant.

Further History

The patient made an uneventful convalescence and on January 4 was discharged with the wound in good condition.

January 8 he was seen in the Follow-up Clinic. The wound was well healed. He was referred to the X-ray Department for examination with a question of duodenal ulcer. A gastro-intestinal series showed no evidence of organic disease in the gastro-intestinal tract. January 15 he came again to the Follow-up Clinic. The wound was healing well. He was told to report again in two months.

DIAGNOSIS

Teratoma of the right testicle, non-malignant.

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DISCUSSION AND DISCUSSION

A VISITOR[1] to this country, who spent several years in our midst, was impressed by the absence among us of discussion as a method of promoting knowledge. He does not say it is a lost art, something which once was ours and has now passed from us. When he cites prohibition as an example of a subject that might well be, but is not, generally discussed, we perceive that he distinguishes between discussion and torrential outpouring of words. Concerning most questions, he thinks one of two points of view prevails: either we think we know it all, or we think we do not want to know anything about it. In either case, discussion is irrelevant.

That the general criticism concerning discussion is, for another reason, pertinent to the medical profession in Boston, has been illustrated on at least two occasions recently. A proposed meeting (of physicians) to discuss birth control had to be given up because it was alleged such discussion would split the profession and wreck a certain medical society. Not long ago, at a meeting of the Council of the Massachusetts Medical Society, it was moved to stop discussion of the report of a committee on medical education because, the maker of the motion said, "there was too much gunpowder lying around". The motion was carried and the discussion was closed although three deans of medical schools in Boston, who had been invited to participate in the discussion, were present and had been given no opportunity to express their views.

It is not disputed that discussion of medical education is sometimes deadly. This result, however, is to be attributed to insidious poisons resulting from incomplete oxidation and ventilation, rather than to any explosive quality inherent in the materials.

Is it temerarious to arrange for a meeting at which nursing education is discussed? At any rate, such a meeting was planned and the attention of the medical and nursing professions was called to the evening of January 29. It is hoped that there was no restriction of discussion because of a fear that some one might say "something hot".

REFERENCE

1 Muirhead, J. H.: The Use of Philosophy. Harvard Univ. Press. Chapter "Discussion in America."

THE CIRCULAR ISSUED BY THE BOSTON MEDICAL LIBRARY

COMMENT on the circular issued by the Boston Medical Library which appeared in the *Boston Transcript* of January 15, 1930, should be read by all who are interested in Medicine.

When the words "interested in medicine" are used they mean an appeal to the great number of people who owe a debt to this important service.

This comment in the *Transcript* sets forth in detail the underlying problems involved in the appeal for support of this institution.

There seems to be some failure to evaluate adequately the blessings of a medical library. This may be because the appeal is less direct than in those cases where institutions ministering to illness put their claims before those who expect to support worthy charities; or it may be that the library stands in some minds in its relation to medical service much like the equipment of the doctor's office or his automobile; that is a means to an end which the doctor must maintain. Such questions are fully answered in the *Transcript* and our reference to the funds already contributed may with propriety be alluded to for in one place the statement is made that the doctors have given until it hurts.

Must the doctors be always giving, giving of their time as well as their money to hospitals, libraries and needy persons? Must doctors be called upon to give again until it hurts still more?

To those who have been favored with an abundance of financial blessings the appeal must be made and the response will reflect the real spirit of philanthropy and civic pride.

This great and useful addition to medical efficiency must be cared for and put in condition to reach the highest degree of usefulness.

IMPORTANT MEETING AT MEDICAL LIBRARY

An event of unusual interest is to take place at the Boston Medical Library, February 5, 1930, when, at a combined meeting of the Suffolk, the Middlesex South, and the Norfolk District Medical Societies, Dr. William H. Welch, Professor of the History of Medicine at Johns Hopkins University, will be the speaker. Dr. Welch, who comes here in the interests of the Massachusetts Medical Society and the Boston Medical Library, can rightfully be considered as one of the deans of the medical profession in this country. His various activities cover a long period of years from the early days of the Johns Hopkins Hospital, when he was the pathologist in the Osler era, to his most recent interests in the history of medicine and medical libraries. Only last fall there was opened, in Baltimore, the William H. Welch Medical Library, a building dedicated to the interests of the Johns Hopkins Hospital and Medical School. In this library, in addition, a great center of medical history has been established with Dr. Welch at the head.

The New England Journal of Medicine, in the name of the Massachusetts Medical Society, welcomes to Boston one of the great leaders of the medical profession. A warm friend of our Society, our Library and our Journal, no one needs less of an introduction to the Massachusetts physicians than Dr. Welch.

THIS WEEK'S ISSUE

Contains articles by the following named authors:

Levene, George. M.D. Boston University School of Medicine 1925. First Assistant Roentgenologist, Massachusetts Memorial Hospitals. Assistant in Roentgenology, Evans Memorial for Clinical Research and Preventive Medicine and Boston University School of Medicine. Address: 351 Winter Street, Norwood, Mass. Associated with him is:

Whitaker, Lester R. M.D. Harvard 1923. Assistant in Anatomy and Surgery, Boston University School of Medicine. Second Assistant Visiting Surgeon, Massachusetts Memorial Hospitals. Associate Member, Evans Memorial for Clinical Research and Preventive Medicine. Address: 270 Commonwealth Avenue, Boston. Their subject is: "New Methods for the Clinical Study of the Gall-Bladder." Page 203.

Bigelow, George H. A.B., M.D. Harvard 1916. Doctor of Public Health 1921; Commissioner of Public Health for Massachusetts. Address: State House, Boston, Mass. Associated with him is:

Hamblen, Angeline D. A.B. Radcliffe, 1915. Statistician, Massachusetts Department of Public Health, 1920. Address: Room 546, State House, Boston. Their subject is: "Changing Causes of Death." Page 215.

Lane, Edward A. A.B., M.D. Cornell, 1916. Assistant Director, Division of Communicable Diseases, Massachusetts Department of Public Health. His subject is: "Undulant Fever." Page 217. Address: 546 State House, Boston, Mass.

Young, Edward L. Jr. A.B., M.D. Harvard 1909. F.A.C.S. Assistant Surgeon, Massachusetts General Hospital. Surgeon, Faulkner Hospital, New England Baptist Hospital and R. B. Brigham Hospital. His subject is: "The Graham Test." Page 219. Address: 279 Clarendon Street, Boston.

Holmes, Arthur D. B.S., Ph.D. Johns Hopkins University, 1911. Teaching Record Laboratory Assistant, Dartmouth College, 1905-1906. Instructor in Chemistry in University of Maine 1906-1907; in Massachusetts Agricultural College, 1907-1908 and Georgia School of Technology, Sept. 1911-Dec. 1911. Research Chemist, U. S. Dept. Agriculture, Dec. 1911-1918. Research Chemist, U. S. Department Agriculture, Dec. 1911-1918. Research Chemist, E. I. Dupont Co. 3 years and at present Director of Research, The E. L. Patch Company, Stoneham, which is his present address. Associated with him is:

Pigott, Madeleine G. B.S. in Chemistry, Tufts College Graduate Work in Medical Sciences, Harvard Medical School. Research Assistant, Harvard Medical School, and E. L. Patch Co. Address: E. L. Patch Company, Stoneham, Mass. And

Sawyer, William Alfred. B.S., M.D. University of Pennsylvania 1913. Medical Director, Eastman Kodak Company, Rochester, New York. Address: 343 State Street, Rochester, New York. And

Comstock, Laura. B.S., M.A. Teachers College, Columbia University. Head of Department of Home Economics, University of Maine 1909-1913. Extension Professor of Home Economics, Massachusetts Agricultural College 1913-1920. Nutrition Adviser, Medical Department, Eastman Kodak Company 1922-. Address: 343 State Street, Rochester, New York. Their subject is: "The Economic Value of Cod Liver Oil and Milk as Dietary Supplements for Underweight Adults." Page 225.

Alden, Carmi R. M.D. Tufts College Medical School 1919. Chief of Gynecology and Obstetrics, Roxbury Hospital. Junior Visiting Surgeon to Gynecology and Obstetrics, Boston City Hospital. Assistant in Gynecology, Harvard Medical School. Instructor in Obstetrics, Tufts College Medical School. His subject is: "An Unusual Case of Pelvic Abscess." Page

230. Address: 270 Commonwealth Avenue, Boston.

TOWLE, HARVEY P. A.B., M.D. Harvard 1892. Consultant, Massachusetts General Hospital. Ex-President, American Dermatological Association. Address: 453 Marlboro Street, Boston. Associated with him is:

GRUND, JACOB L. M.D. Harvard 1921. Assistant in Dermatology and Syphilology, Massachusetts Memorial Hospitals and Boston University School of Medicine; Member, New England Dermatological Society. Address: 483 Beacon Street, Boston. They present: "Progress in Dermatology." Page 231.

The Massachusetts Medical Society

STATED MEETING OF THE COUNCIL

A stated meeting of the Council will be held in John Ware Hall, Boston Medical Library, 8 The Fenway, Boston, on Wednesday, February 5, 1930, at 12 o'clock, noon.

Business:

1. Reading minutes of last meeting in abstract.
2. Report of Committee on Membership and Finance, on Membership.
3. Reports of committees appointed to consider petitions for restoration to the privileges of fellowship and appointment of committees to consider new petitions.
4. Appointment of three delegates and three alternates to the House of Delegates, American Medical Association, for two years from June 1, 1930.
5. Appointment of delegates of the Annual Congress on Medical Education, Licensure and Hospitals of the American Medical Association, at Chicago, February 17, 18, and 19, 1930.
6. Appointment of delegates to the annual meetings of the five New England State Medical Societies.
7. Report of the Treasurer and Auditing Committee.
8. Report of the Committee on Membership and Finance, on Finance, with Budget for 1930.
9. Reports of any standing or special committees.
10. Incidental Business.

WALTER L. BURRAGE,
Secretary.

Brookline, January 29, 1930.

MASSACHUSETTS LEGISLATIVE NOTES

Senate No. 182 is to provide equitable relief and to prevent hardship in certain cases under the Workmen's Compensation Act. Hearing February 24, Room 427, State House, at 10 o'clock.

Senate No. 183 limits the scope of the laws relative to payment of workmen's compensation to employees of the commonwealth or any political subdivision thereof. Hearing same as Senate No. 182.

House No. 384 is an act to authorize the dissemination of contraceptive information. Hearing February 24, Room 450, State House, at 11 o'clock.

House No. 645 is relative to the payment of workmen's compensation in case of death. Hearing February 19, Room 427, State House, at 10 o'clock.

House No. 787 is relative to the period during which a lump sum award may be made under the Workmen's Compensation Law in the case of a minor. Hearing February 24, Room 427, State House, at 10 o'clock.

House No. 788 is relative to the amount of compensation payable for certain injuries under the Workmen's Compensation Law. Hearing February 17, Room 427, State House, at 10 o'clock.

Hearing on House No. 351 will be continued before the committee on State Administration February 17 at 10:30 A. M. This is an act to create a Department of Public Medicine and Health which shall take over the activities of the Department of Public Health and of the Department of Mental Diseases and certain of the activities of the Department of Public Welfare and the Department of Industrial Accidents.

MISCELLANY

RÉSUMÉ OF COMMUNICABLE DISEASES IN MASSACHUSETTS FOR DECEMBER, 1929

GENERAL PREVALENCE

The reported incidence of communicable diseases was distinctly low, falling 2,000 cases below the number reported for December, 1928.

Diphtheria continued more prevalent than last year.

The incidence of lobar pneumonia was slightly high.

As a result of the local outbreak in Lowell, the incidence of typhoid fever was distinctively higher than anticipated.

The reported incidence of chickenpox, German measles, mumps, scarlet fever, non-pulmonary tuberculosis and whooping cough was within endemic limits.

Pulmonary tuberculosis established a new low December figure, this being the tenth time this year that a low monthly mark has been reached.

The reported incidence of anterior poliomyelitis, influenza and measles was also low.

Gonorrhea and syphilis continued to be poorly reported.

RARE DISEASES

Anterior Poliomyelitis was reported from Boston, 4; Ipswich, 1; Milford, 1; Quincy, 1; Wellesley, 1; Worcester, 1; total, 9.

Anthrax was reported from Haverhill, 1; total, 1.

Encephalitis lethargica was reported from Boston, 2; Milford, 1; Springfield, 1; Worcester, 1; total, 5.

Epidemic cerebrospinal meningitis was reported from Andover, 1; Boston, 3; Chicopee, 1; Gardner, 1; Hingham, 1; Leominster, 1; Quincy, 1; Salem, 2; Springfield, 1; total, 12.

Malaria was reported from Boston, 1; Everett, 1; total, 2.

Septic sore throat was reported from Belmont, 1; Beverly, 2; Boston, 11; Cambridge, 2; Holyoke, 1; Lawrence, 1; Leominster, 1; Lynn, 1; Revere, 1; Stockbridge, 1; total, 22.

Tetanus was reported from Attleboro, 1; total, 1.

Trachoma was reported from Boston, 1; Cambridge, 1; Lynn, 1; Malden, 1; Methuen, 1; Quincy, 1; total, 6.

Trichinosis was reported from Attleboro, 1; total, 1.

MONTHLY REPORT OF CERTAIN COMMUNICABLE DISEASES.

	Cases in Entire Population				Case Rates per 100,000 Pop.		
	Dec. 1929	Dec. 1928	Prosodemic Index	Epidemic Index	Dec. 1929	Dec. 1928	Expected Rate***
ALL CAUSES	7220	9248	-	-	164.5	213.8	-
Ant. Poliomyelitis	9	10	22*	.4**	.2	.2	.5
Diphtheria	517	483	381*	1.4**	11.8	11.2	8.7
Measles	681	2754	1798*	.4**	15.5	63.7	41.0
Pneumonia, Lobar	472	550	402*	1.2**	10.8	12.7	9.2
Scarlet Fever	1177	1037	1326*	.9**	26.9	24.0	30.3
Tuberculosis, Pul.	315	371	409*	.8**	7.2	8.6	9.3
Typhoid Fever	27	14	22*	1.2**	.6	.3	.5
Whooping Cough	960	588	962*	1.0**	21.9	13.6	22.0
Chicken Pox	1425	1567	-	-	32.5	36.2	-
German Measles	34	37	-	-	.8	.9	-
Gonorrhea	400	364	-	-	9.1	8.4	-
Influenza	33	478	-	-	.8	11.1	-
Mumps	562	308	-	-	12.8	7.1	-
Syphilis	152	123	-	-	3.5	2.8	-
Tuberculosis, O.F.	40	47	-	-	.9	1.1	-

* This Index is an attempt to estimate the number of cases based on the trend during the past years which can be expected to occur, and is for the purpose of comparison with the number of cases which actually did occur.

** This ratio expresses how prevalent the disease is compared with the index mentioned above; 1.0 indicates that the actual number of cases equals the expected number. A larger number means a greater prevalence, and a smaller number a lesser prevalence than expected. Thus, 2.0 would indicate twice the expected number of cases, and .5 half the expected number of cases. The method used to determine the indices is described in the August 18, 1927 issue of the Boston Medical and Surgical Journal.

*** Calculated from the Prosodemic Index.

HEALTH CONDITIONS IN THE UNITED STATES DURING THE PAST FISCAL YEAR

A summary of health conditions in the United States during the past fiscal year is included in a report recently submitted to Congress by Surgeon General H. S. Cumming of the Public Health Service. This report indicates that bubonic plague was reported in California and the Island of Hawaii during the fiscal year.

Preliminary reports show that the birth rate in the United States birth registration area for the calendar year 1928 was lower than in 1927, while the death rate was higher. The figures for births were: 1927, 20.7 per 1,000; 1928, 19.7 per 1,000; for deaths, 1927, 11.4 per 1,000; 1928, 12.1 per 1,000. The infant mortality rate for 1928, 67.9 per 1,000 births, was higher than in 1927, 64.6 per 1,000 births.

The outbreak of influenza, which began in the spring of 1928, decreased as usual during the summer months and flared up into epidemic proportions during the fall of 1928, was responsible for much, if not all, of the increase in the death rate for the calendar year 1928. In the fall the epidemic was first reported on the Pacific Coast and then spread rapidly eastward, reaching its peak for the country as a whole about the first of the year 1929.

The disease in many parts of the country was so mild that physicians hesitated to report it as influ-

enza and many cases were considered to be merely severe colds and were not seen by physicians. However, the general death rate rose far above the normal during the epidemic, which did not continue for many weeks in any one place.

Surveys conducted by the Public Health Service in certain States concerning the influenza epidemic of 1928-29 showed that nearly 15 per cent. of the population canvassed in various localities gave a history of having suffered attacks of influenza or grippe, while 0.47 per cent. gave a history of pneumonia and an additional 14 per cent. reported colds which may or may not have been directly related to the epidemic.

During the calendar year 1928, 38,000 cases of smallpox reported in the United States; in 1927, 35,000 cases were reported. It seems strange that year after year more cases of smallpox are reported in the United States than in any other country of the world except British India, yet this disease can be controlled by vaccination and revaccination and with the co-öperation of the public could be stamped out in the course of a few years.

More cases of cerebrospinal meningitis were reported during 1928 than have been reported since 1918. This disease appears to increase and decrease in swells of several years' duration and for the last five years it has been increasing.

The record for the calendar year 1928 shows a new low death rate for typhoid fever. This disease was responsible for 34 deaths per 100,000 population at the beginning of the present century. The mortality has decreased until in 1928, 43 States reported only 5,425 deaths, giving a death rate of 4.8 per 100,000. This reduction of 86 per cent. in the death rate from typhoid fever has been brought about largely through the practical application of the principles of modern sanitary science. Health officers and others interested in sanitation who have had a part in this work may well be proud of the results accomplished.

Tuberculosis, which has been decreasing since the beginning of the century when comparable annual records of deaths were first published, showed during the year 1928 the lowest general death rate ever recorded by the Public Health Service for that disease. The death rate for 1928 was 77.5 per 100,000 population. In 1900 in the death registration area the death rate from tuberculosis was more than 200 per 100,000.

The number of deaths from pellagra in 43 States increased from 4,794 in 1926 to 6,652 in 1928. The death rates range for 1928 from 50 per 100,000 in South Carolina and 42 in Mississippi to less than one-tenth of one per 100,000 in several States. The disease is more prevalent in rural districts than it is in the cities and Southern States have higher rates than Northern States.

Incomplete reports show that undulant fever is much more prevalent in the United States than had been realized. Reports from many sources, some of them not official, show that there were at least 649 recognized cases of undulant fever in the United States in 1928.

Four hundred and eighty cases of tularaemia with 8 deaths were officially reported to the Public Health Service for the year 1928. Many cases of this disease are not reported.

Typhus fever is another disease for which the reports are incomplete. The mild form of this disease (sometimes called Brill's disease) was prevalent during 1928, especially in the Southeastern States. One hundred and forty-three cases, with 12 deaths, were reported.—*United States Public Health Service.*

NEW YORK'S HEALTH ACTIVITIES

Health Commissioner Shirley W. Wynne, of New York, in his recent report to Mayor Walker, emphasized particularly the increasing participation of the private physician in the city's program of preventive medicine. Thus, in the recent campaign against diphtheria, which reduced the cases by 2,226, approximately one-third of all the children were immunized by their family physicians.

"Public policy," according to Dr. Wynne, "requires that health service should be paid for by those able to do so, and still more important is the consideration that private physicians should be encouraged and assisted in practising preventive medicine."

CORRESPONDENCE

BOAL'S ROLLS CORPORATION SUBJECT OF FEDERAL TRADE COMMISSION COMPLAINT

To Medical Publications:

On October 23, 1929, the Federal Trade Commission issued its complaint against the Boal's Rolls Corporation, a New York corporation, with its principal place of business located in Chicago, Illinois. The complaint states that the organization has been engaged in the business of manufacturing, advertising and selling in interstate commerce for more than a year medicinal products under the trade name of Boal's Rolls, and continues as follows:

> "*Paragraph Two:* The respondent in the course and conduct of its business as set out in Paragraph One hereof in soliciting the sale of and selling its products in interstate commerce caused advertisements to be inserted in newspapers and other publications having a circulation between and among various states of the United States which said advertisements contain, among other, the following language: 'Why Experiment? Tonight Take a Boal's Roll. To Prevent Constipation and The Flu.' A circular sent out with samples of the product described it as a 'delicious Fruit Laxative composed of figs and other fruit.' The containers of the product shipped by said Boal's Rolls Corporation had labels affixed thereto upon which appeared an illustration of a bowl of various kinds of fruit depicting fruits other than figs and raisins, with the following, among other printed matter: 'Boal's Rolls. A luscious laxative real fruit medicated for constipation.' In truth and in fact the laxative properties of the re-

spondent's product are not due to a fruit ingredient but to the presence therein of phenol-phthalein, cascara and senna nor is the product a preventive for constipation and influenza.

"*Paragraph Three:* The use by the respondent of such phrases and illustrations as above set out in connection with or as designating and describing its product has the capacity and tendency to mislead and deceive the purchasing public into the belief that its said product so represented, designated and described is a natural fruit laxative, a preventive for constipation and influenza."

NATIONAL BETTER BUSINESS BUREAU, INC.
Commercial Department.

PUBLIC HEALTH INSTRUCTION

To the Editor of The NEW ENGLAND JOURNAL OF MEDICINE:

At the present time, the desirability of the dissemination to the public of sound knowledge upon health protection and the prevention of disease is in the air.

The public seems eager for such knowledge as shown by the popular Harvard lectures Sunday afternoons. The layman seems to have taken the lead in this matter rather than the individualistic physician. The Providence plan, referred to by Dr. Cheever, in your issue of January 16, may not be a proper way of offering a "sound health program"; but the average physician and perhaps the average medical society seem to be slow in recognizing their obligations to the community in this direction.

In this connection may I call attention to the admirable Shattuck lecture of Dr. W. H. Robey given last June before the Massachusetts Medical Society on "Public Instruction in Medicine," in which a wider dissemination of health knowledge to the public is discussed. The public seems to be waiting for it; are the physicians eager to give it?

EDWARD O. OTIS, M.D.

ARTICLES ACCEPTED BY THE AMERICAN MEDICAL ASSOCIATION COUNCIL ON PHARMACY AND CHEMISTRY

535 North Dearborn Street, Chicago, Ill.,
January 24, 1930.

The NEW ENGLAND JOURNAL OF MEDICINE,
165 Newbury St.,
Boston, Mass.

Dear Editor:

In addition to the articles enumerated in our letter of December 28, the following have been accepted:

Abbott Laboratories
Butesin Picrate Eye Ointment

Lakeside Laboratories, Inc.
Ampoules Dextrose (d-Glucose) 10 Gm., 20 c.c.
Ampoule No. 51 Sodium Cacodylate 0.243 Gm. (3 3/4 grains), 5 c.c.

H. K. Mulford Co.
Pneumococcus Antibody Solution, Types I, II and III Combined-Mulford, four 50 c.c. double-ended vials.

The following articles have been exempted and included with the List of Exempted Medicinal Articles (New and Nonofficial Remedies, 1929, p. 481):

Davies, Rose & Co., Ltd.
Pil. Digitalis (Davies, Rose)

Kings County Packing Co.
Sac-A-Rin Brand California Bartlett Pears
Sac-A-Rin Brand California Tidbits Hawaiian Pineapple
Sac-A-Rin Brand California Royal Anne Cherries

Lakeside Laboratories, Inc.
Ampoule No. 64 Calcium Chloride 10%

Yours truly,
W. A. PUCKNER, *Secretary*,
Council on Pharmacy and Chemistry.

RECENT DEATH

ROTHWELL—DR. CHARLES ROBERT ROTHWELL, a Fellow of the Massachusetts Medical Society, died at his home in South Boston, after a short illness, January 23, 1930, at the age of 59.

Born in Ireland, the son of Archdeacon Rothwell of Ardmore, he received his early education there and was a licentiate of the Royal College of Surgeons of Ireland.

Dr. Rothwell had been president of the South Boston Medical Society and a member of the South Boston Yacht Club. He was interested in athletics, especially in tennis.

He is survived by his widow, Esther Falkiner Rothwell, and by two unmarried daughters.

NEWS ITEMS

FALL RIVER MEDICAL SOCIETY—Dr. Edward M. Hodgkins, Assistant Professor of Surgery at Tufts Medical School, will speak February 12, before the Fall River Medical Society on the Use of Fascial Sutures in the Cure of Recurrent Inguinal Hernia. Dr. Hodgkins will give at this time a lantern slide demonstration of his own original operation.

DR. WILINSKY RETURNS TO CITY SERVICE—Dr. Charles F. Wilinsky, it is reported, has finally been prevailed upon by Mayor Curley to return to his old position as director of child hygiene and of the health units in the municipal health department, which he left four years ago to assume the direction of the Beth Israel Hospital. Whatever post Dr. Wilinsky accepts, it goes almost without saying that his efforts will meet with success, and wherever he goes his numerous friends continue to wish him well.

RESIGNATION OF DR. MATTHIAS NICOLL, JR.—Dr. Matthias Nicoll, Jr., has resigned from his position as State Commissioner of Health of New York. He has accepted the position of head of the new health department of Westchester County at a salary of $12,000.

The Governor of New York has expressed regret at the loss of Dr. Nicoll's services. Dr. Nicoll has held office as Health Commissioner since 1923 after having served as Secretary for eight years. He will have a free hand in the new position which he will occupy after a month's leave of absence.

DR. MEAKER ELECTED A FELLOW OF THE BRITISH COLLEGE OF OBSTETRICIANS AND GYNAECOLOGISTS—Dr. Samuel R. Meaker, associate professor of gynaecology in the Boston University School of Medicine and gynaecologist to the Massachusetts Memorial Hospitals, has been elected a Fellow of the British College of Obstetricians and Gynaecologists.

DR. PHANEUF SPEAKER IN BUFFALO—Dr. Louis E. Phaneuf, Professor of Gynecology, Tufts College Medical School, addressed the Section of Obstetrics of the Buffalo Academy of Medicine on January 22, 1930. His subject was—"Repair of Complete Perineal Lacerations."

DR. MYERSON SPEAKER AT YOUNG MEN'S HEBREW ASSOCIATION — Dr. Abraham Myerson, author of several books, spoke on "Fatigue" at the forum of the Boston Young Men's Hebrew Association in the gymnasium, Seaver street and Humboldt avenue, Roxbury, Sunday evening, January 26.

REPORTS AND NOTICES OF MEETINGS

PLYMOUTH DISTRICT MEDICAL SOCIETY

The January Meeting of the Massachusetts Medical Society (Plymouth District) was held at the Brockton Hospital on Thursday, January 16, 1930.

Dr. Thomas H. McCarthy, President of the Society, opened the meeting promptly at 11:00 A. M. A short business meeting was held prior to the literary program. The Secretary of the Society, Dr. George A. Moore, read his report for the July and October meetings. The report of the Treasurer was then read, and accepted. The Society then voted to give the Legislative Committee full power to entertain the legislators of Plymouth County for the purpose of explaining the bills pertaining to the Medical Profession impending before the Legislature of 1930. This Committee consists of Dr. George A. Moore, Brockton, chairman, Dr. R. B. Rand, North Abington, Dr. Walter Pulsifer, Whitman, Dr. J. J. McNamara, Brockton, Dr. A. C. Smith, Brockton, Dr. John P. Shaw, Brockton, Dr. Charles Hammond, Hanover, Dr. Edgar D. Hill, Plymouth, Dr. E. J. Beaulieu, Whitman, Dr. A. W. Carr, Bridgewater, Dr. J. H. Dunn, Rockland, Dr. I. I. Richmond, East Bridgewater, Dr. Nathaniel K. Noyes, Duxbury, Dr. Thomas H. McCarthy, President of the Society ex-officio.

After a good deal of discussion, the Society voted to endorse the program as outlined by Dr. Joseph Pratt of Boston, pertaining to the holding of clinics in hospitals and other places. Dr. Pratt is Chairman of the Massachusetts Central Health Council. He recommended a system of control pertaining to the admission of charitable patients to Hospital Clinics, Special and Industrial Clinics and Health Associations. Dr. Thomas H. McCarthy, President of the Plymouth District Medical Society, announced the receipt of a letter from Dr. William Mayo, Chief Surgeon and head of the Mayo Clinic of Rochester, Minn., in which he stated that if he was in the East next winter he would be pleased to address the Plymouth County Medical Society.

Dr. Thomas H. McCarthy then proceeded with the Literary Program. He introduced Dr. Charles E. Mongan of Boston, who very briefly gave introductory remarks on puerperal sepsis before the Society was privileged to witness moving pictures of a case of face presentation in obstetrics. Dr. Mongan stated that in the absence of Dr. Phaneuf, Chairman of the Department of Obstetrics of the Massachusetts Medical Society, he would give the Society a brief outline.

"We are trying to bring obstetrics to a higher level from a purely educational standpoint and to give you a definite program, we want you to give us your support. We feel that this subject from an advanced standpoint has been dead for a good many years. We want to improve it. Our Committee works the whole year. It is different from other Committees. We are taking a period of five years on investigation on puerperal sepsis. When this report is made it is a public document. We intend to send to all doctors a communication to give to us a report of this particular condition. At the present time, obstetrics is a target for everyone. We are doing this in order to help the various doctors give better service to the community.

"When the different doctors are asked to give a report concerning a case of this kind, it is given willingly. Men report honestly with few exceptions. This afternoon, we will give you a face presentation. Dr. Kellogg, instructor of Obstetrics at the Harvard Medical School, will discuss the film, explaining in detail the acts of the operator from start to finish, until the delivery takes place and the case is completed. This film has been shown in over eighteen cities and towns and over a thousand people will benefit from it."

Dr. Mongan then retired and the moving picture was shown. Dr. Kellogg was assisted by Dr. Lynch and Dr. Paine. After the moving picture was completed a general discussion took place. The different members of the Society asked Dr. Kellogg questions pertaining to face presentation. There were seventy physicians present including representatives from all of the surrounding towns. Many of them took part in the discussion.

The Society adjourned to the hospital dining hall where a very excellent dinner was served under the direction of the Brockton Hospital Executive Committee, with Dr. Frederick M. Hollister, Superintendent of the Brockton Hospital, in personal charge. He proved to be a very excellent host and a rising vote of thanks by the Society was given to him for his splendid effort, in entertaining the Plymouth District Society.

WORCESTER NORTH DISTRICT MEDICAL SOCIETY

The regular quarterly meeting was held by invitation at the Henry Heywood Memorial Hospital, Gardner, Tuesday, January 28, 1930, at 4 P. M.

Speaker—Dr. Foster Kellogg.

Subject—Toxemias of Pregnancy including Eclampsia.

F. R. DAME, *President.*
C. H. JENNING, *Secretary.*

HAMPDEN DISTRICT MEDICAL SOCIETY

The regular winter meeting of the Society was held in the rooms of the Springfield Academy of Medicine, 20 Maple street, Springfield, on Tuesday, January 28, at 4 P. M.

Papers for the afternoon:—

"The Management of the Diabetic," illustrated by lantern slides. Dr. Howard F. Root and Dr. W. Stanley Curtis of Boston.

Discussion by Fellows.

HERVEY L. SMITH,
Secretary and Treasurer.

SUFFOLK, MIDDLESEX SOUTH AND NORFOLK DISTRICT MEDICAL SOCIETIES IN CONJUNCTION WITH THE BOSTON MEDICAL LIBRARY

At Boston Medical Library, John Ware Hall, Wednesday, February 15, 1930, at 8:15 P. M.

Joint Meeting:

Dr. William H. Welch, Professor of the History of Medicine, Johns Hopkins University, will speak on "Medical Libraries and the Profession."

Dr. Harvey Cushing will preside.

LINCOLN DAVIS, M.D.
FRESENIUS VAN NÜYS, M.D.
SYLVESTER F. MCKEEN, M.D.
HILBERT F. DAY, M.D.

BERKSHIRE DISTRICT MEDICAL SOCIETY

The February meeting of the Berkshire District Medical Society will be held at the Hotel Wendell, in Pittsfield, February 13, beginning with dinner at six-thirty.

The guest speaker is Dr. I. S. Tunick of New York. His subject will be "The Injection Treatment of Varicose Veins and Ulcers." The lecture will be illustrated with lantern slides.

Under the supervision of the Department of Public Health, we will have the Canti Film and descriptive lecture by Mr. Bernard E. Bradley of Boston, Massachusetts.

HUGH DOWNEY, *Secretary.*

MASSACHUSETTS MEDICO-LEGAL SOCIETY

The Massachusetts Medico-Legal Society will hold a meeting Feb. 5 at the Harvard Medical School at which Dr. A. Warren Stearns, Dean of Tufts Medical School, and Commissioner of the State Department of Correction, will speak on Suicide.

MASSACHUSETTS PSYCHIATRIC SOCIETY

The next meeting of the Massachusetts Psychiatric Society will be held at the Boston Psychopathic Hospital, Friday evening, February 7. The following papers from the Boston State Hospital Research Department will be presented:

"Basic Considerations of the Physiological Approach to Psychiatry," Dr. Abraham Myerson; "Comparison of Treated and Untreated Cases of General Paresis," Dr. Julius Loman; "Sedimentation Rate in the Psychoses," Miss Caroline Stephenson, A.B.; "Haematological Researches in the Psychoses With Especial Reference to General Paresis," Dr. William Dameshek; "Bio-Chemical Studies of Brain Activity by the Jugular Puncture Method," Dr. Ray B. Halloran.

WINFRED OVERHOLSER, *Secretary.*

WORCESTER NORTH CANCER CLINIC, 1930

MEETS TUESDAYS

10.00 A. M.—*Leominster Hospital*—February 18, March 11, April 1 and 22, May 13, June 3 and 24, July 15, August 5 and 26, September 16, October 7 and 28, November 18, December 9 and 30.

9.30 A. M.—*Henry Heywood Memorial Hospital*—February 4 and 25, March 18, April 8 and 29, May 20, June 10, July 1 and 22, August 12, September 2 and 23, October 14, November 4 and 25, December 16.

10.00 A. M.—*Burbank Hospital*—February 11, March 4 and 25, April 15, May 6 and 27, June 17, July 8 and 29, August 19, September 9 and 30, October 21, November 11, December 2 and 23.

Any physician referring a case of suspected cancer to the Clinic will receive a letter giving diagnosis and recommendations as to treatment. If the physician so requests, treatment will be undertaken by the Clinic to which the patient is referred; otherwise the patient will be returned to his own physician with suggestions for appropriate treatment.

AMERICAN HEART ASSOCIATION, INC.

The Annual Meeting of the American Heart Association will be held on Monday, February 3, 1930, at the New York Academy of Medicine, Fifth Avenue and 103rd Street, New York.

I. C. RIGGIN, M.D., *Executive Secretary.*

GREATER BOSTON MEDICAL SOCIETY

A Joint Meeting of the Greater Boston Medical Society and the Beth Israel Hospital will be held on Tuesday, February 4, at 8.15 P. M. at the Beth Israel Hospital. Program:

Dr. Albert A. Epstein, "A Consideration of the Present Day Problems in Diabetes Mellitus."

Discussion: Dr. Elliott P. Joslin, Dr. Louis J. Ullian, Dr. Abraham Rudy.

LOUIS SILVER, M. D., *Secretary.*

SOCIETY MEETINGS, CONGRESSES AND CONFERENCES

1929-1930—Massachusetts Dietetic Association. Complete schedule appears on page 852, issue of October 24.

February 3—American Heart Association. Complete notice appears on page 251.

February 4—The Greater Boston Medical Society and the Beth Israel Hospital. Detailed notice appears on page 251.

February 5—Massachusetts Medico-Legal Society. Complete notice appears on page 251.

February 7—Massachusetts Psychiatric Society. Detailed notice appears on page 251.

February 10-14—American College of Physicians. Complete notice appears on page 853, issue of October 24.

February 12, 19 and 26—Harvard Medical School. Lectures on "The Care of the Patient." Amphitheater C at 5 P. M. as follows: Wednesday, February 12—Dr. James D. Heard, Professor of Medicine, University of Pittsburgh, School of Medicine. Wednesday, February 19—Dr. Daniel Fiske Jones, Associate in Surgery, Harvard Medical School; Dr. George W. Gay Lecture on Medical Ethics. Wednesday, February 26—Dr. Samuel B. Woodward, Ex-President, Massachusetts Medical Society.

February 15—Boston Medical Library meeting in conjunction with Suffolk, Middlesex South, and Norfolk District Medical Societies. Complete notice appears on page 251.

March-October — International Medical Postgraduate Courses in Berlin. Complete notice appears on page 853, issue of October 24

April 14-18—The New England Public Health Institute. Complete notice appears on page 55, issue of January 2.

May 2—Annual Meeting of the American Society of Stomatologists. Detailed notice appears on page 92, issue of January 9.

May 5-10—First International Congress on Mental Hygiene. Detailed notice appears on page 93, issue of January 9.

September 4-8—Fifth International Congress on Physiotherapy. Complete notice appears on page 906, issue of October 31.

October 27—The American Public Health Association. Detailed notice appears on page 1271, issue of December 19.

DISTRICT MEDICAL SOCIETIES

Berkshire District Medical Society

January 30—Complete notice for this meeting appears on page 148, issue of January 16.

February 13—Detailed notice for this meeting appears on page 251.

Essex North District Medical Society

May 1—Thursday—Censors' meeting at Hotel Bartlett, 95 Main Street, Haverhill, (Telephone 3430) at 2 P. M. sharp. Candidates should present their diplomas to the Secretary one week in advance.

May 7—Wednesday—Annual Meeting.

J. FORREST BURNHAM, M.D., Secretary.

Essex South District Medical Society

Wednesday, February 5, 1930—Council Meeting (Massachusetts Medical Society), Boston.

Wednesday, February 12, 1930—Danvers State Hospital, Hathorne. Clinic 5 P. M. Dinner 7 P. M. Speakers: Dr. Winfred Overholser. Subject: "Criminology and Psychiatry." Mr. Clark, District Attorney for Essex County, who will speak on the legal aspect.

Wednesday, March 5, 1930—Lynn Hospital. Clinic 5 P. M. Dinner 7 P. M. Speaker: Dr. R. S. Titus, Boston. Subject: "Some Aspects of Caesarean Section," illustrated with Moving Pictures. General Discussion from the floor.

Wednesday, April 2, 1930—Hotel Hawthorne, Salem. Dinner at 7 P. M. Speaker: Dr. Timothy Leary, Boston. Subject: "Diagnostic and Therapeutic Pitfalls in Intracranial Pyogenic Infections."

Thursday, May 1, 1930—Censors meet for Examination of Candidates at Salem Hospital at 3:30 P. M.

Tuesday, May 13, 1930—Annual Meeting. The Tavern, Gloucester. Speaker: Dr. C. Macfie Campbell, Director of Boston Psychopathic Hospital. Subject to be announced later. Ladies invited. Dancing.

R. E. STONE, M.D., Secretary.

Franklin District Medical Society

The meetings of the Franklin District Medical Society will be held at the Weldon Hotel, Greenfield, Mass., on the second Tuesdays of March and May, at 11 A. M.

CHARLES MOLINE, M.D., Secretary.

Hampshire District Medical Society

Meetings of Hampshire District will occur at 11 A. M. the second Wednesdays of February and April and will be held at the Dickinson Hospital, Northampton. The annual meeting will be held in May.

LUTHER O. WHITMAN, M.D., Secretary.

Middlesex East District Medical Society

March 12—At Melrose.

May 13—At Unicorn Country Club, Stoneham.

ALLAN R. CUNNINGHAM, M.D., Secretary.

Middlesex South District Medical Society

February 15—Meeting in conjunction with Suffolk and Norfolk District Medical Societies and the Boston Medical Library. Complete notice appears on page 251.

April 16, 1930—Annual Meeting. Commander Hotel, Cambridge. Program to be announced.

May, 1930—Censors' meeting.

ALEXANDER A. LEVI, M.D., Secretary.

Norfolk District Medical Society

February 15—Meeting in conjunction with Suffolk and Middlesex South District Medical Societies and the Boston Medical Library. Complete notice appears on page 251.

February 24, 1930—Roxbury Masonic Temple, 8:00. Dr Edwin H. Place has been invited to read a paper and has been given carte blanche in the selection of his subject.

March 24, 1930—Roxbury Masonic Temple. Dr. Burton E. Hamilton. Subject to be announced.

May 6, 1930—Annual Meeting. Program to be announced.

The Censors meet for the examination of candidates, May 1, 1930, in the Roxbury Masonic Temple, 171 Warren Street, Roxbury, at 4:00 P. M.

Applications must be in the hands of the Secretary at least one week previous to date of examination.

Owing to inability to engage the Roxbury Masonic Apartments on the last Tuesday of the month, such meetings as will be held in the Roxbury Temple will be held Monday evenings as per the dates above.

FRANK S. CRUICKSHANK, M.D., Secretary.

Plymouth District Medical Society

March 20, 1930—Moore Hospital, Brockton. Speakers to be announced later.

April 17, 1930—Annual Meeting, Commercial Club, Brockton, 7 P. M. Election of officers. Annual oration, Dr. Frederick F. Weiner, "The Management of Prostatic Diseases," with moving pictures.

G. A. MOORE, M.D., Secretary.

Suffolk District Medical Society

February 15—Meeting in conjunction with Middlesex Boston Medical Library. Complete notice appears on page 251.

BOOK REVIEWS

The Treatment of Chronic Deafness. By The Electrophonoide Method of Zund-Burguet. By GEORGE C. CATHCART. Oxford Medical Publications.

This entertaining English monograph of eighty-five pages deals with one specific therapeutic solution of the age-old problem of chronic deafness. The preliminary chapters deal in a somewhat elementary manner with the basic elements of sound perceptions, and the causative factors of chronic deafness, such particularly as occlusions of the external auditory canal, nasopharyngeal infections secondary to adenoid and tonsil disease, and the pathological changes which thereby ensue in the middle ear structures. Prevention in childhood is stressed in preference to attempted cures in adult life.

The author next describes the novel and quite original method of treatment first advanced by Dr. A. Zund-Burguet of Paris. It is termed a method of re-education, the rationale of which is based on the attempts of many previous investigations to improve a patient's hearing by repeated stimulation of the auditory mechanism by sounds of more than ordinary intensity. Gradually it may be possible to diminish the intensity as the function of hearing responds until by this constant stimulus, re-education, hearing is once more brought within a more normal

range. This form of treatment must be carried out persistently, frequently and over long periods of time. Obviously it is not likely to prove satisfactory in any average case.

The Zund-Burguet method has sought to solve these difficulties to some extent by the use of a complicated electrical apparatus whereby a wide range of sounds can be produced to simulate all the tonal variations and intensities found in the human voice. By subjecting deaf patients to such stimulation for a sufficient number of treatments (30, in any case which is making any progress) a considerable improvement has been noted for the patient's perception of the human voice. The details of the use and workings of the machine are so complicated that even the author's description is far from clear. At best the treatment is highly tedious for both patient and physician and its percentage of complete failures even to improve hearing is high, but in the face of the inactivity of any other methods to help, the author reports a sufficient number of cases in which hearing has become markedly improved, to warrant attention and interest of American otologists.

Surgical Clinics of North America. Lahey Clinic Number. December, 1929. W. B. Saunders Co., Philadelphia.

This issue of the Surgical Clinics shows much more correlation between the various topics than is usual and all of them are of interest and value.

The topic that is most thoroughly covered is surgery of the thyroid gland. Lahey emphasizes the importance of care in handling the cases of *apathetic thyroidism as distinctive to activating thyroidism.* These patients show little of the characteristic evidence of toxicity and may even appear in complete repose, yet after operation they may lapse into unconsciousness and die without any of the features of the postoperative storm of the activating type.

The *diagnosis of substernal goiter* is discussed by Clute. A goiter may disappear by slipping below the sternum. Hoarseness is one of the most common symptoms. The diagnosis is confirmed by X-ray evidence showing deviation of the trachea.

Hurxthal gives a careful review of the *significance of the various signs and symptoms following subtotal thyroidectomy for hyperthyroidism,* viz.: postoperative myxedema, tetany, persistent thyroidism, recurrent hyperthyroidism and laryngeal paralysis.

Lahey advises a two-stage subtotal thyroidectomy in cases of *primary hyperthyroidism in children.*

Several valuable points in technic are given by Mason in a lucid description of the *control of the blood supply in subtotal thyroidectomy.* The important vessels should be carefully isolated and doubly ligated.

Cattell reports a successful case of *the intracardiac injection of epinephrine in cardiac syncope.*

Sise contributes some very interesting data on various forms of anaesthesia. He carefully outlines the causes, prevention and treatment of *vascular depression of spinal anaesthesia.* Epinephrine is the most valuable agent in treatment. Sodium amytal used intravenously and avertin given by rectum are two newer anaesthetics useful for a prolonged light anaesthesia and having definite advantages in a restricted group of cases.

A practical discussion of *appendicitis—chronic and acute,* is given by Lahey. The diagnosis of chronic appendicitis is justified in a patient with a history of an obvious acute attack followed by persistent or recurrent pain in the right iliac fossa. A rectal examination should be made in every case suspected of having acute appendicitis. If a drain is used, it should be left for at least a week.

Clute believes that the use of *mattressed peritoneal sutures in epigastric incisions* minimizes postoperative hernia.

The *surgical indications in cancer of the stomach* are outlined by Jordan. In a doubtful case operation is indicated if during a short period of medical management there is persistence of ulcer symptoms, persistence of occult blood in stools, or persistence of the ulcer niche.

After a study of sixteen patients on the Sippy regime for a long period, Kiefer concludes that the *effect of the alkali treatment of peptic ulcer upon the kidney* is insignificant.

Mason reports the use of fascia in the repair of *inguinal hernia, avulsion of the tibial tubercle,* and *rupture of the quadriceps tendon.*

The difficult subject of *low back pain from lumbosacral anomaly* is ably presented by Haggart.

These with several other valuable articles make this number both interesting and practical.

Diseases of the Blood. By PAUL W. CLOUGH, M.D. Harper Brothers, Publishers, New York and London. $2.50.

This monograph is a lucid and authentic presentation of the salient facts of hematology. Controversial matters of which there are many, are studiously avoided, in so far as possible, thus tending to diminish the confusion which confronts medical students in this field. The attitude taken towards terminology is sane and conservative. This book indicates competent authorship and is particularly valuable for students or for review purposes by practitioners.

The Medical Museum: Modern Developments, Organization and Technical Methods Based on a New System of Visual Teaching, by S. H. DAUKES, Director of the Wellcome Museum of Medical Science. London: The Wellcome Foundation, Ltd. 183 pages.

The Wellcome Medical Museum in London has grown, in a period of ten or twelve years, to be a national institution. It began during the war, expanded greatly during the British National Exhibition at Wembley, in 1924, and has finally been housed in splendid quarters in London itself. The museum is arranged on an etiological basis, containing specimens, charts, and other material, carefully grouped together, illustrating a single disease or a group

of diseases. All this material is beautifully mounted and carefully labelled. The present book contains a description of the museum, with many notes on the classification of museum specimens, the type of buildings useful for collections of this kind, and technical details in regard to cases, screens, illustrations, the mounting of specimens, methods of preservation, and an extensive bibliography of works on these subjects. There are numerous illustrations showing the methods of grouping the specimens and demonstrating them. The book is beautifully printed and is a great credit to one of the finest museums of its type in the world. Everyone connected with medical museums in this country, or anywhere in the world, will be delighted with a book of this type.

A Manual of Midwifery. By HENRY JELLETT, B.A., M.D. (Dub.), F.R.C.P.I. and DAVID G. MODILL, B.A., M.B., B.Ch., Fourth Edition. B.A.O. (Dub.) New York: William Wood and Company. 1929. Price $10.00.

This fourth edition of a well-known standard textbook of obstetrics for students and practitioners embodies important recent developments in the science since 1921, and serves to bring again before the profession the admirable methods of practice of the Rotunda Hospital. The chapters on eclampsia, contracted pelvis, and antepartum hemorrhage have been rewritten, and new sections have been added on anesthesia, pyelitis, and nephritic and pre-eclamptic toxemia. The book is illustrated with 570 text figures, a few in colors. As a compendium of Irish obstetrics it deserves especial attention, on account of its combination of sane conservatism with receptive alertness to genuine medical progress.

The Care of the Nose, Throat and Ear. By W. STUART LOW, F.R.C.S., England. (Consulting Surgeon to the Central London Nose and Ear Hospital, Lecturer on Rhinology, Medical Graduates College, London; Fellow of Royal Society of Medicine.) Published by Bailliere, Tindall and Cox, London.

This little primer of 88 pages is written for the layman, in an attempt to explain the anatomy and pathology of the nose, throat and the ear. It is well written, easily read, and will satisfy the curious.

Surgical and Medical Gynecologic Technic. By THOMAS H. CHENY, M.D., F.A.C.S. Philadelphia: F. A. Davis Company. 1929. Price $8.00.

This excellent monograph is essentially a treatise on operative technic, not a systematic textbook of diagnosis and treatment. It presents one standard method and does not undertake to discuss the relative units of different operations for the same condition. As is usual, it makes no reference to the importance of ptosis in relation to retroversion, procidentia, and pelvic congestion. Certainly the outstanding merit of this admirable book is its illustrations,—558 halftone and line engravings from photographs and pen and ink drawings by the author. All these are of graphic clearness, and make possible the easy comprehension and demonstration of every step of operative procedure. Equally clear is the accompanying descriptive text. The book should have a wide and lasting value to the medical and surgical practitioner.

The Most Nearly Perfect Food: The Story of Milk, by SAMUEL J. CRUMBINE, M.D., and JAMES A. TOBEY, Ph.D. Baltimore: The Williams & Wilkins Company, 1929. xi + 292 pages. Price, $2.50.

This is an excellent small book on milk and its uses, covering not only the scientific data in regard to the composition of milk, but also a large amount of information on the preservation, transportation and the use of milk in cooking. Some of the chapters have appeared in medical and lay journals. The book is obviously written for popular and semi-popular consumption. It can be highly recommended.

BOOKS RECEIVED FOR REVIEW

The Care of the Nose, Throat, and Ear by W. Stuart-Low. Second Edition. Published by Baillière, Tindall and Cox. 88 Pages.

The Medical Museum—Modern Developments, Organization and Technical Methods Based on a New System of Visual Teaching by S. H. Daukes. Published by the Wellcome Foundation Ltd. 172 Pages.

Incompatibility in Prescriptions and How to Avoid It by Thomas Stephenson. Published by Paul B. Hoeber, Inc. 61 Pages. Price $1.50.

The Most Nearly Perfect Food by Samuel J. Crumbine and James A. Tobey. Published by Williams & Wilkins Company. 292 Pages. Price $2.50.

Études Sur Les Maladies Familiales Nerveuses et Dystrophiques by O. Crouzon. Préface du Pr. Pierre-Marie. Published by Masson et Cie Éditeurs. 385 Pages. Price 55 fr.

Handbook of Bacteriology for Nurses by Harry W. Carey. Third Revised and Enlarged Edition. Published by F. A. Davis Company, Publishers. 282 Pages. Price $2.25.

Psychiatrie du Médecin Practicien by M. Dide and P. Guiraud. Second Edition. Published by Masson et Cie, Éditeurs. 466 Pages. Price 45 fr.

Urologie Pratique by Dr. P. Bazy. Published by Gauthier-Villars et Cie. 533 Pages. Price 80 fr.

L'Hydrothérapie médicale by R. Dubois de Saujon (Les Actualités Physiothérapiques, Hydrothérapie VI). Published by Gauthier-Villars et Cie, Éditeurs. 129 Pages. Price 15 fr.

Research and Medical Progress and Other Addresses by J. Shelton Horsley. Published by C. V. Mosby Company. 208 Pages. Price $2.00.

The Diagnosis of Health by William R. P. Emerson. Published by D. Appleton and Company. 272 Pages. Price $3.00.

Hypertension and Nephritis by Arthur M. Fishberg. Published by Lea and Febiger. 566 Pages. Price $6.50.

The Essentials of Histology by Sir Edward Sharpey Schafer. Twelfth Edition. Published by Lea and Febiger. 628 Pages. Price $5.00.